2 4 0001

4328

REMOVAL ACTION PLAN
for the

CHEVRON CHEMICAL COMPANY SITE
ORLANDO, FLORIDA

July 1991

Prepared for: CHEVRON CHEMICAL COMPANY
San Ramon, California

Prepared by: BROWN AND CALDWELL CONSULTANTS
5110 Eisenhower Boulevard, Suite 230
Tampa, Florida 33634

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

TABLE OF CONTENTS

APPENDICES

CHAPTER 1.0

INTRODUCTION

This Removal Action Plan was prepared in accordance with the Administrative Order on Consent with Chevron Chemical Company, Mr. Robert R. Uttal, and the U.S. Environmental Protection Agency (EPA) (EPA Docket No. 90-37-C). Mr. Uttal is the current owner of the site and Chevron Chemical is the former site owner.

Preceding the development of this plan, a site history was compiled from Chevron Chemical Company files, and interviews with Chevron staff and Mr. Uttal, and a contamination assessment was conducted. This chapter presents a brief synopsis of the site history and previous site investigations, including a summary of the contamination assessment completed in 1990. The Contamination Assessment Report (Brown and Caldwell, 1990), is included herein by reference.

In the concluding subsection of this chapter, the purpose and scope of the Removal Action Plan (RAP) are discussed. Subsequent chapters present removal action goals, summary and detailed descriptions of the removal action, the removal goal verification plan, the project management plan, and the removal action schedule.

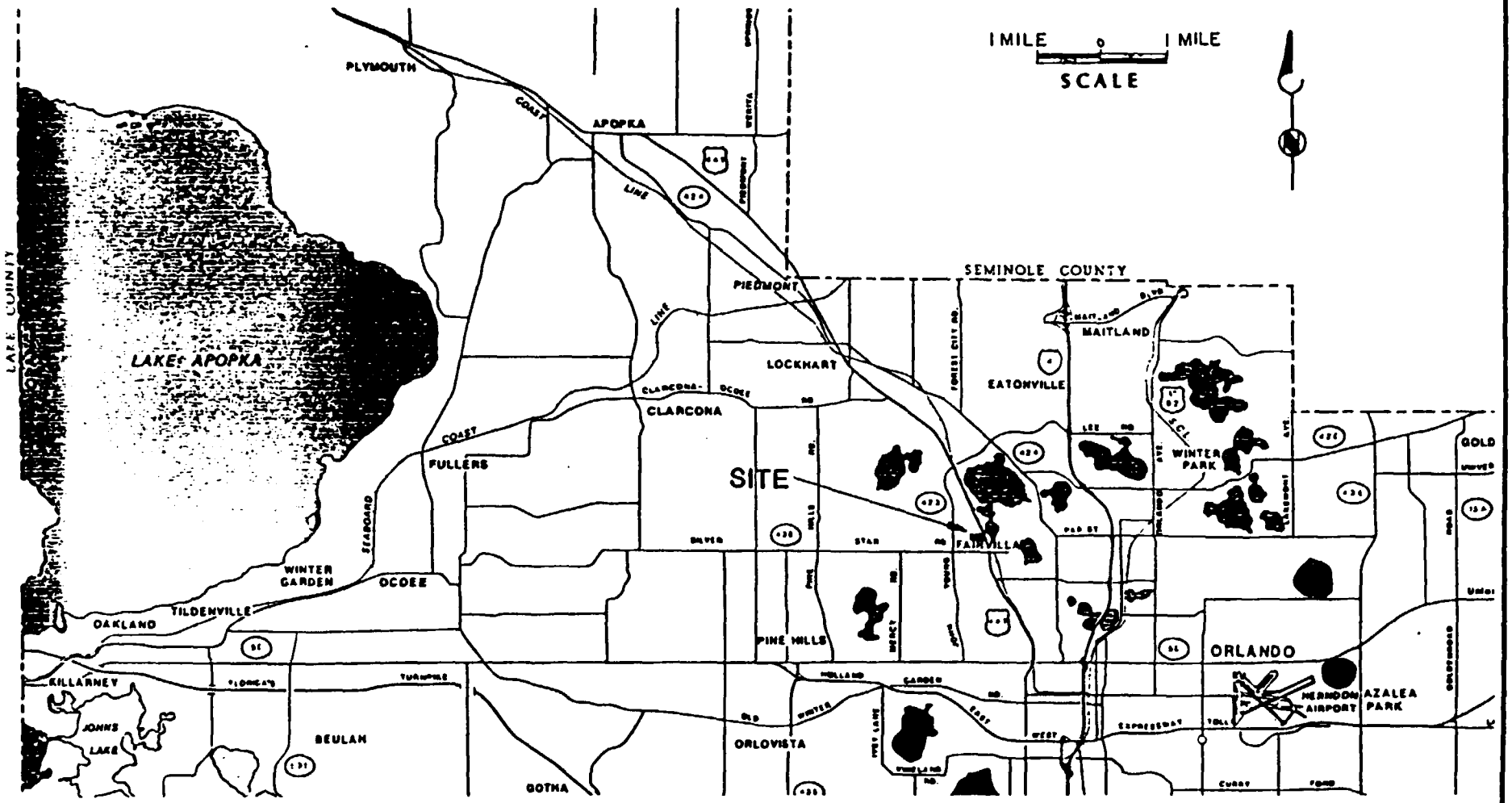
1.1 BACKGROUND

The former Chevron Chemical Company site (site) is located in an industrial area in the 3100 block of North Orange Blossom Trail (Highway 441) in Orlando, Florida (Figures 1-1 and 1-2). The site is bordered to the east by Orange Blossom Trail, which serves as the main access to the site, to the west by industrial facilities, to the south by active railroad tracks, and to the north by a mobile home park. Lake Fairview is located approximately 1,000 feet northeast of the property. The total area of the site is 4.39 acres (EPA, 1990).

See Figures 1-1 and 1-2

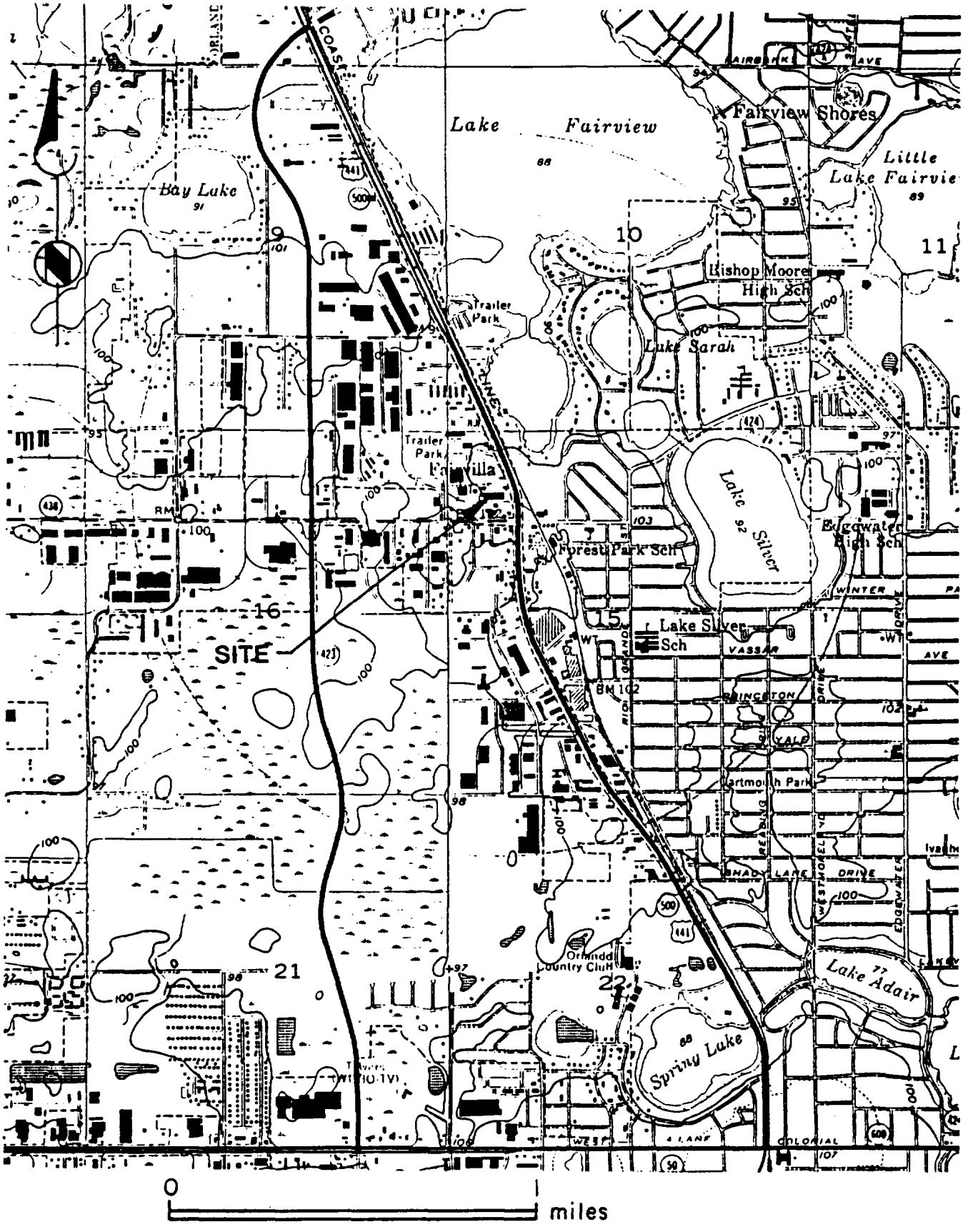
Between the years 1950 to 1976, Chevron Chemical Company utilized the site for the formulation of a variety of liquid and powdered pesticides, citric sprays, and "nutritional" sprays. The majority of the active pesticide ingredients were delivered in drums by trailer trucks. Bulk liquids, usually carrier solvents, were delivered by tanker trucks and very occasionally by tank railroad car. Finished packaged goods were shipped by truck. No rail shipment of finished goods occurred due to the local nature of the business.

Chemicals used in pesticide formulation included xylene, kerosene, mineral oil, and aromatic naphtha. Pesticides formulated in large volumes consisted of parathion, chlordane, phaltan, captan, malathion, and paraquat. Pesticides formulated in smaller volumes consisted



Brown and Caldwell Consultants

Figure 1–1. Site Location Map



Brown and Caldwell Consultants

Figure 1–2. Vicinity Map

of DDT, difolatan, BHC-lindane, dieldrin, aldrin, dibromamine, and "nutritional" sprays (aqueous solutions of copper, zinc, manganese, sulfur, and boron) (Patry, 1987).

The main features of the former pesticide formulating facility, as illustrated in Figure 1-3, consisted of seven above ground bulk liquid storage tanks, a barrel storage area, a barrel rinse area, two pesticide rinsate ponds, three septic tank drain fields, an underground storage tank, a large building which housed the dry and liquid pesticide formulating and warehousing operations, and an office building.

See Figure 1-3

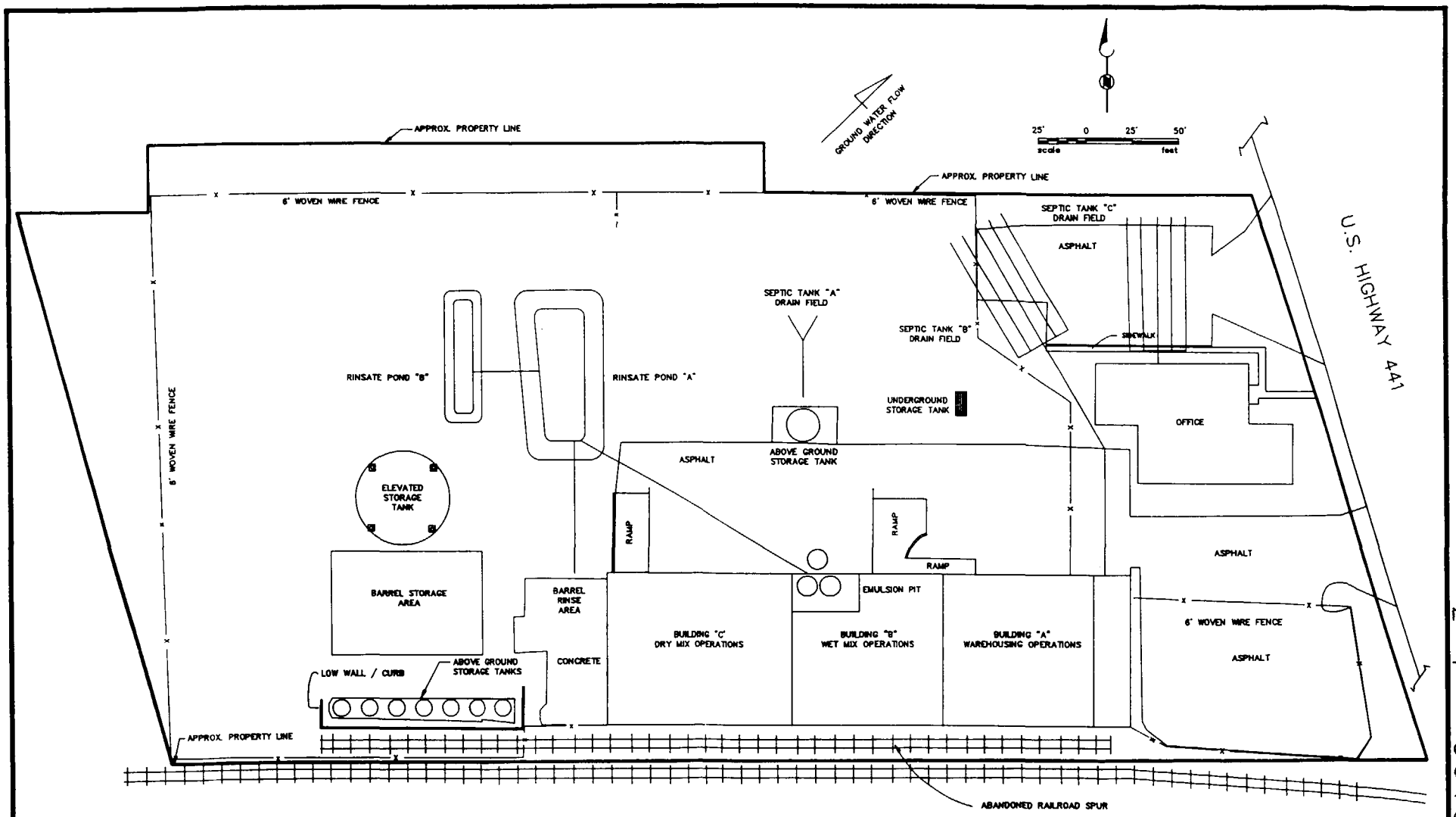
In 1976, Chevron ceased pesticide formulating operations at the site. The remaining inventories were removed from the site. Chevron drained all equipment and lines, and washed down the formulating areas with water. The rinsate ponds were backfilled with soil between 1976 and 1978. The storage of small quantities of pesticides may have occurred at the site during this same period.

In 1978, the site was purchased with an "as is, where is" contractual condition by Mr. Robert R. Uttal, who leased the site as Central Florida Mack Trucks Company, a truck sales and service facility (EPA, 1990). Mr. Uttal reported (Patry, 1987, and Starosciak, et al, 1990) that he cleaned the facility prior to leasing the property, to include:

- Drumming and offsite disposal of dust remaining in the pesticide formulating/warehouse building.
- Washing and rinsing the interior of the building with soap and water.
- Rinsing the floor with mineral spirits.
- Filling the dust mill pit and drain lines with sand and concrete.
- Filling the underground storage tank with concrete.
- Placing concrete alongside of the pesticide formulating/warehouse building and in the rinsate pond for stabilization.

Mr. Uttal closed down his operation on November 2, 1986. In 1987, Mr. Uttal leased the property to Mr. Richard Keating (Starosciak, et al, 1990). The property was used as a vehicle storage area by Mr. Keating until 1988, when Mr. Keating vacated the property.

In the evening of March 1, 1991, a fire occurred in the warehouse at the site. As a result of the fire, the pesticide formulating/warehousing building collapsed. Portions of the collapsed building came to rest on the rail spur area. On March 8, 1991, OHM Corporation cleared the rail spur area of the building debris. The building debris removed from the rail spur area was placed on the asphalt north of the truck service bay area. Once the rail spur area was



SOURCE OF BASE MAP: PARRY, J.J., 1987

Brown and Caldwell Consultants	FILE FIG1-3.DWG DRAWN M.D. DESIGNED N/A CHECKED M.P.S.	LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"—SCALE ACCORDINGLY)	CHEVRON CHEMICAL COMPANY CHEVRON SITE — ORLANDO	FIGURE 1-3. SITE LAYOUT CHEVRON OPERATIONS

cleared, the existing chain link fence along the south property line was extended from the southwest to the southeast corner of the pesticide formulating/warehousing building.

1.2 PREVIOUS INVESTIGATIONS

At the request of Chevron Chemical Company, Dames & Moore conducted an investigation to determine the extent of soil and groundwater contamination at the site from the prior chemical facility operation. The investigation was conducted in the summers of 1981 and 1982. The final report was issued in January 1983. Laboratory analysis of soil samples for pesticides indicated the presence of chlordane and lindane. Laboratory analysis of groundwater samples for pesticides and metals indicated that concentrations of arsenic and lindane exceeded primary drinking water standards. Chlordane, o,p-DDD, and p,p-DDD were identified in concentrations exceeding EPA guidelines found in Quality Criteria for Water, 1976. Dames & Moore concluded that the soil and groundwater contamination was mainly attributable to the past use of the pesticide rinsate ponds. It was also concluded that pesticides are not likely migrating offsite in the groundwater, but that arsenic could potentially migrate offsite in the groundwater in concentrations exceeding the primary drinking water standard (EPA, 1990).

In January 1987, Southeastern Investment Properties, Inc., considering the purchase of the site, retained Jammal & Associates to investigate the site. Analysis of groundwater samples for purgeable halocarbons and purgeable aromatic compounds indicated the presence of benzene, xylene, trichloroethane, 1-1-dichloroethane, 1,2-dichloroethane, methylene chloride, and chlorobenzene in concentrations above State of Florida maximum contaminant levels (MCLs) for drinking water. These compounds were detected in the groundwater in the vicinity of the former rinsate ponds, near the rail spur, and in the southwest corner of the site. This second investigation did not include analysis for pesticides.

In May 1989, NUS Corporation (a contractor for EPA) conducted a site screening inspection under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). NUS collected surface and subsurface soil, and groundwater samples from the site (EPA, 1990). The analytical results for the soil samples indicated the presence of pesticides, benzene, toluene, xylene, naphthalene compounds, and metals along the rail spur adjacent to the floor drain outfall. Chlordane was detected in the southwest corner of the site. In the vicinity of the former rinsate ponds, pesticides, metals, benzene, toluene, xylene, and naphthalene compounds were detected.

In the groundwater samples, metals, benzene, toluene, and xylene were detected in the rail spur area near the floor drain outfall. In the vicinity of the rinsate ponds, metals, pesticides, xylene, benzene, trichloroethylene, and chlorobenzene were detected.

1.3 CONTAMINATION ASSESSMENT

In July 1990, a Site Cleanup Workplan was prepared by Brown and Caldwell which presented a description of the field investigation methods to be used for a comprehensive

contamination assessment of the site, upon which a site cleanup plan would be based. The field investigation methods were selected to provide data necessary to determine the degree and extent of soil and groundwater contamination at the site, and to assess the hydrogeology of the site. The activities conducted at the site included: 1) clearing the northern and western portions of the site, 2) a ground penetrating radar (GPR) survey to aid in the location of soil borings, and to investigate possible buried containers, 3) soil sampling and analysis, 4) sampling and analysis of sediment from an offsite stormwater retention pond which receives runoff from the site, 5) groundwater monitor well installation, sampling and analysis, and 6) aquifer testing.

1.3.1 Site Hydrogeology

Information gathered during the September and October 1990 field investigations indicates that the site is underlain by organic-rich, fine to very fine quartz sands to a depth of approximately 33 feet. This sand horizon becomes saturated with water between 6 and 8 feet below land surface, forming an unconfined groundwater aquifer. Water table elevation contours suggest a northeasterly groundwater flow direction for the shallow portion of the aquifer beneath the site, with a gradient of approximately 0.006. Assuming a hydraulic conductivity of 3 feet per day and an effective porosity of 0.20, the groundwater velocity (as calculated using the Darcy equation) is 0.09 feet per day.

A deeper, semi-confined unit (probably the top of the Hawthorn formation) also appears to be present beneath the site. Groundwater flow in the semi-confined unit appears to be in a northerly direction. The groundwater gradient is approximately 0.002. Making the same assumptions previously used, the average velocity of groundwater flow in this deeper unit is 0.3 feet per day.

1.3.2 Soil Sampling Results

Soil samples were collected to determine the degree and extent of soil contamination in potential contaminant source areas (e.g., rinsate pond area), and to screen the northern and western portions of the site for contamination. The samples were collected and analyzed using the designated EPA methods for volatile organics (Methods 8010 and 8020); semivolatile organics, organochlorine pesticides and polychlorinated biphenyls (PCBs) (Method 8270); organochlorine pesticides and PCBs (Method 8080); organophosphate pesticides (Method 8140); chlorinated herbicides (Method 8150); arsenic (Method 7060); and chromium and zinc (Method 6010). Analysis of each sample was selected based on location and suspected activity.

The Contamination Assessment soil sampling analytical results and contaminant distributions were evaluated and are presented by contaminant type.

1.3.2.1 Volatile Organics Distribution. Volatile organics were detected in the area of the rinsate ponds, the area adjacent to and east of the rinsate ponds, the rail spur area, and barrel storage area. Low levels of xylene were also detected in septic tank drainfields B and C.

Volatile organic contamination in the rinsate pond area was predominantly from xylene. Ethylbenzene, toluene, chlorobenzene, and 1,4-dichlorobenzene were also present. Concentrations of contaminants generally increased by an order of magnitude with depth in the eastern portion of the pond area.

The area adjacent and to the east of the rinsate pond exhibited a pattern of volatile organic contamination similar to the rinsate pond area. This area corresponds to a zone of high non-ionic contamination detected in the GPR survey, and is the location of a vertical above ground storage tank that can be seen in aerial photographs taken in 1969 and 1973.

Volatile organic contaminants in the rail spur area were predominantly xylene and the chlorobenzenes. Volatile organic contamination in the barrel storage area is present in levels approaching those measured within the rinsate pond and adjacent area.

1.3.2.2 Semivolatile Organics Distribution. Semivolatile organics were not detected consistently in soils throughout the site. Methylnaphthalene was detected in two samples from the rinsate pond area in moderately high concentrations. These samples may reflect a localized spill of diesel fuel or other petroleum product. Bis(2-ethylhexyl)phthalate was detected in septic tank drainfield C and at two locations in the rail spur area.

1.3.2.3 Organochlorine Pesticides Distribution. Organochlorine pesticides, predominantly chlordane and gamma-BHC, were identified to be widespread throughout the western and northern sections of the site and along the rail spur. High concentrations were found in and around the rinsate pond area and adjacent to the floor drain outlet along the rail spur. Other organochlorines detected in these areas of the site were heptachlor, endosulfan I, dieldrin, DDT, DDD, DDE, and endrin. Organochlorine pesticides were also high in the rail spur area with additional detection of alpha-, beta-, delta-, and gamma-BHC. Aldrin was also detected at less significant concentrations.

1.3.2.4 Organophosphate Pesticides Distribution. The organophosphate pesticides are not as widely distributed as the organochlorine pesticides. Concentrations of organophosphate pesticides were found in and around the rinsate pond area. Less significant levels were detected in the rail spur and barrel storage area.

Communications with the contracted laboratory indicate that organophosphate pesticides not included in Method 8140, such as ethion and malathion, exist in estimated concentrations as high as 10,000 micrograms per kilogram (µg/kg). Ethion concentrations were calculated by the laboratory for the shallow composite samples and the rail spur area, and ethion appeared to be the predominant organophosphate contaminant.

1.3.2.5 Chlorinated Herbicides. Chlorinated herbicides were not detected at the site. Matrix interference elevated detection limits in all samples analyzed by Method 8150. A single sediment sample collected from a retention pond that receives runoff from the site contained silvex at 25 µg/kg.

1.3.2.6 Metals Distribution. Metals analysis was performed on a limited number of samples restricted to the rinsate pond area, septic tank drainfields, barrel storage area, and rail spur area. With the exception of two sample points in the rail spur area and one sample point in the rinsate pond, total metals were below 50 milligrams per kilogram (mg/kg), with zinc being the predominant metal contaminant.

1.3.3 Groundwater Monitor Well Installation and Sampling Results

Fourteen groundwater monitor wells were installed at the site to determine the degree and extent of groundwater contamination. Of the fourteen monitor wells, nine are 17-feet deep, wells M and P are 22-feet deep, and F, G, and K are 33-feet deep. Locations of wells are given on Figure 1-4.

See Figure 1-4

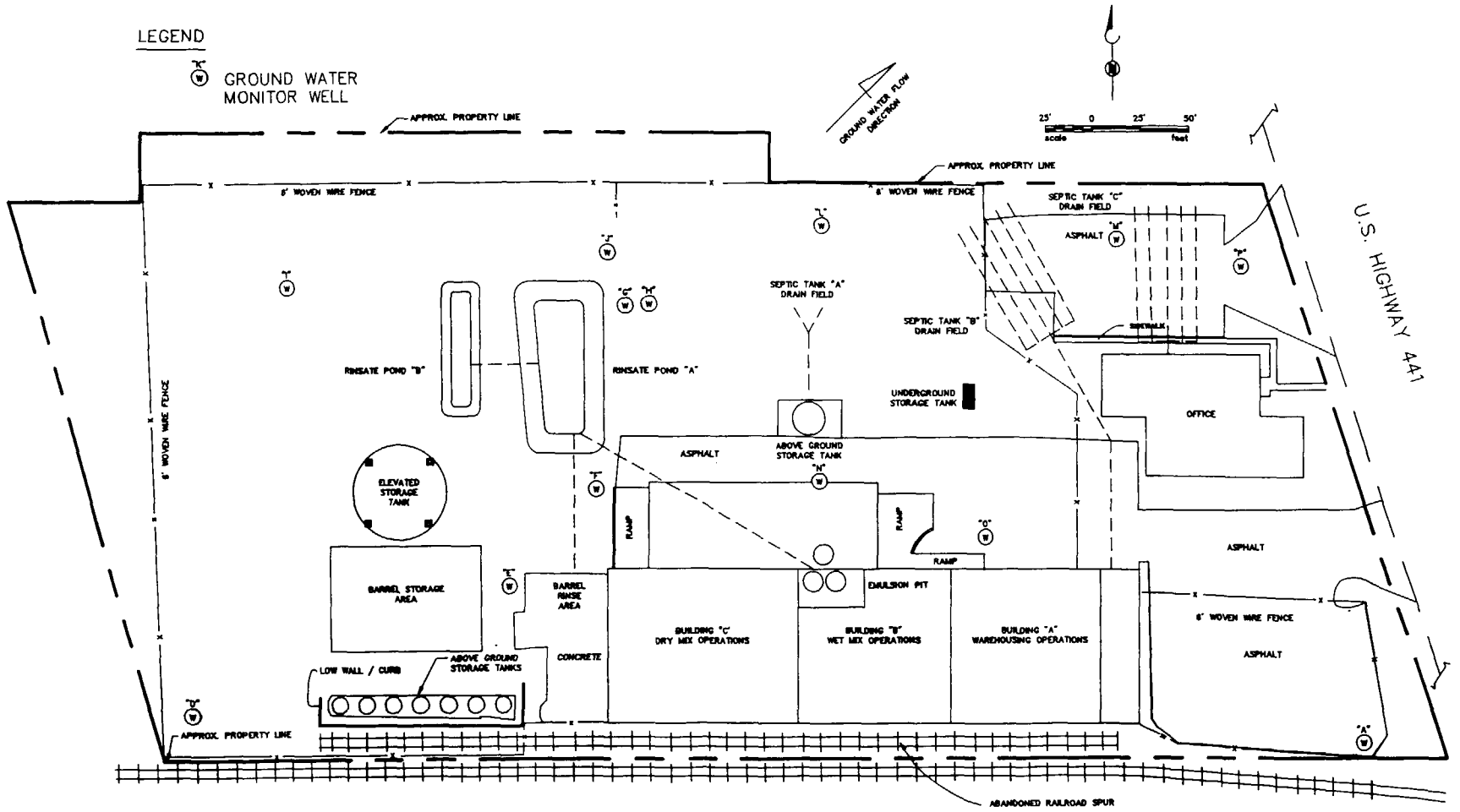
Groundwater analytical results and contaminant distributions were evaluated separately for the shallow wells (monitor wells A, D, E, H, I, J, L, M, N, O, and P), and the deep wells (wells F, G, and K). The contaminants are evaluated using the same analytical categories as used for soil data evaluation.

1.3.3.1 Volatile Organics Distribution. Volatile organic compounds were detected in the surficial aquifer beneath the central and western portions of the site. The distribution and composition of the volatile organics suggests three potential contaminant release scenarios. The predominant volatile contaminant in the groundwater is xylene, as it was for the soil samples, with the highest concentrations in MW-L (5500 micrograms per liter (µg/l)) and MW-E (2500 µg/l). MW-L is downgradient from the aboveground storage tank identified in aerial photographs, and corresponds with an area of high non-ionic response in the GPR survey. MW-E is adjacent to the barrel storage area. MW-K, the deep well in the MW-K, L cluster has significantly lower concentrations of xylene, but demonstrates that the xylene is migrating vertically downward.

The suite of volatile compounds associated with gasoline or diesel fuel were detected in samples from monitor wells H and J presumably reflecting a gasoline or diesel fuel release. Ethylbenzene was detected (along with xylene) in MW-L, K, I, and G, but the other gasoline-type volatiles were not detected.

Purgeable halocarbons were detected in highest concentration in MW-H, with lower concentrations in MW-N, L, J, and F. The predominant source area for the purgeable halocarbons appears to be the rinsate pond, with minor contribution from the formulation building area.

1.3.3.2. Semivolatile Organics Distribution. Semivolatile organics were detected in four wells screened in the shallow zone only, and appear to be centered in the approximate location of the rinsate ponds.



SOURCE OF BASE MAP: PATRY, J.J., 1987

Brown and Caldwell Consultants	FILE FIG1-4.DWG DRAWN M.D. DESIGNED N/A CHECKED M.P.S.	LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)	CHEVRON CHEMICAL COMPANY CHEVRON SITE – ORLANDO	FIGURE 1–4. GROUNDWATER MONITOR WELL LOCATIONS

1.3.3.3 Organochlorine Pesticide Distribution. Two plumes of organochlorine pesticides were identified in the shallow aquifer zone. One plume, located in the area north of the rinsate pond corresponds to areas of high soil contamination. The second plume, located in the eastern portion of the site, appears to be centered around MW-O. This area is covered with concrete/asphalt, and soil sampling was not conducted over much of this area. Soil samples collected in the septic tank area adjacent to MW-M and MW-P did not contain organochlorine pesticides.

The primary groundwater contaminants are the BHC isomers, with minor contributions from aldrin, 4,4'-DDD, endrin, endosulfan I, and heptachlor. Florida Drinking Water Standards are available for gamma-BHC (lindane) and endrin, at 4 µg/l and 0.2 µg/l, respectively. The Drinking Water Standard for lindane was exceeded in wells J and O, and for endrin in wells J, M, and the duplicate sample from well H. Organochlorine pesticides were also detected in two of the three deeper wells, confirming downward vertical migration of these contaminants.

The rinsate pond and the rail spur area are the two most apparent source areas for the BHC isomers. Based on the available data, select organochlorine pesticides appear to be migrating off site in the groundwater in a northerly and northeasterly direction. However, additional off site data are required to determine whether off site migration is occurring. Additional sampling with depth is also required to determine the vertical extent of contaminant migration.

1.3.3.4 Organophosphate Pesticide Distribution. Of the organophosphate pesticides, demeton-O is the predominant groundwater contaminant. The demeton-O distribution is similar to the distribution of organochlorine pesticides, with a plume associated with the rinsate pond, and a plume in the northeast portion of the site. Parathion and methyl parathion were detected in MW-P only, and are probably the result of a parathion spill reported in the northeast portion of the site.

1.3.3.5 Metals Distribution. The arsenic, chromium, and zinc distribution in the groundwater is sporadic and does not reflect a definitive source area onsite. Arsenic was detected in three shallow wells (MW-H, J, and L) and no deep wells. Chromium was detected in seven shallow wells, with the highest concentration (in the shallow zone) in the southeast corner of the site (MW-A at 0.1 mg/l). Chromium was also detected in MW-G, which may reflect contribution from the rinsate pond. Zinc was detected in 10 monitor wells, but in concentrations well below the drinking water standard.

1.3.4 Conclusions

Based on the data evaluation presented in the Contamination Assessment, it was determined that additional site characterization is required to fully delineate the extent of soil and groundwater contamination at the site. The results of the assessment indicate that several pesticides and volatile organic compounds are present in the soils on the site, and that additional

soil characterization data are required to develop an effective soil cleanup plan. Based on the contaminant concentrations in the soils and the toxicity of the contaminants present, the contaminant of most concern in the soil is chlordane. Chlordane is present in the rail spur area, in the area of the former rinsate ponds, and northwest of the former rinsate ponds.

The results of the groundwater investigation indicate that there are two plumes of contaminated groundwater which may be migrating offsite. In order to fully delineate the extent of these plumes and to determine whether offsite migration is occurring, additional groundwater characterization is required. The recommended additional groundwater characterization is summarized in Section 4.1.5.

1.4 REMOVAL ACTION PLAN - PURPOSE AND SCOPE

The purpose of this RAP is to satisfy the requirements set forth in the Administrative Order on Consent (AOC), EPA Docket No. 90-37-C, to abate the release or threat of release of hazardous substances from the facility into the environment. Based on the results of the contamination assessment, EPA identified the need for removal (cleanup) of soils onsite which are contaminated with pesticides. EPA further defined cleanup concentrations and suggested that chlordane be used as the indicator chemical. The EPA-defined removal action concentration goals are 50 milligrams per kilogram (mg/kg) total pesticides in soils from land surface to 1-foot and 100 mg/kg total pesticides in soils from 1-foot to the water table. The removal action, as described herein, includes excavation of soils which are contaminated with pesticides in concentrations which exceed those described above, and disposal of soils in a hazardous waste management facility.

Chevron Chemical Company has identified several removal action objectives which will also be achieved through implementation of this RAP. These objectives include:

- Performance of a risk assessment to determine risk-based soil and groundwater removal action goals.
- Additional investigation of the groundwater to determine the magnitude and extent of the contaminant plume.
- Excavation and disposal of soils to achieve the risk-based removal action goals.
- Groundwater recovery and treatment (if necessary) to achieve the risk-based groundwater removal action goals.

The AOC lists specific elements which are included in this RAP, as follows:

- Cleanup Methodology
- Transportation and Disposal of Hazardous Materials
- Site Restoration

- Cleanup Schedule
- Health and Safety Plan
- Sampling and Analysis Plan

To describe the basis for the removal action methodology selected for the site, the removal action objectives and goals are discussed in Chapter 2. A summary description of the removal action is presented in Chapter 3, and Chapter 4 presents a detailed description of the removal action tasks from contractor procurement through site restoration. Chapter 4 also addresses transportation and disposal of hazardous materials to be removed from the site, as well as optional onsite soil treatment which may be performed to meet the risk-based goals.

Chapters 5 and 6 of the RAP present a discussion of the removal goal verification monitoring and the project management plan, respectively. Chapter 7 presents the removal action schedule to reflect the duration and relationship of each element of the removal action.

The Health and Safety Plan (HSP), which is developed to describe the appropriate health and safety procedures for all aspects of the removal action, is presented under separate cover. A Health and Safety Plan has also been prepared by Chevron's selected construction contractor, and will also be submitted under separate cover.

To meet the AOC requirements relative to documentation of sampling and analysis methods and quality assurance/quality control (QA/QC) procedures, a Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) have been prepared under separate cover. These plans address the sampling and analytical protocols, and the QA/QC procedures to be utilized in all aspects of the removal action, including:

- Soil sampling and analyses using onsite mobile laboratory.
- Confirmatory soil sampling and analyses using offsite laboratory.
- Groundwater monitor well installation and sampling.
- Laboratory analysis of groundwater samples.

CHAPTER 2.0

REMOVAL ACTION GOALS AND OBJECTIVES

EPA, in conjunction with the Agency for Toxic Substances and Disease Registry (ATSDR) defined removal action goals for the soils on the site. As described in the April 11, 1991 memorandum from ATSDR to EPA, the goals are to remove shallow soils (0- to 1-foot below land surface) with total pesticide concentrations in excess of 50 mg/kg, and to remove deeper soils (1-foot to the water table) with total pesticide concentrations in excess of 100 mg/kg. ATSDR further recommended that chlordane be used as the indicator chemical.

ATSDR concluded that "the actions proposed for the surface/shallow subsurface cleanup may not be found to be adequate to protect the environment by the remedial branch of Superfund, should this site be added to the National Priorities List." It is Chevron Chemical Company's objective to conduct the removal actions necessary to remediate the site to the extent that any requirements of the remedial branch of Superfund will be met. To accomplish this objective, a risk assessment will be conducted, as described in Section 4.1.6, to provide risk-based soil and groundwater removal goals. Additional soil removal activities and long-term groundwater remediation (if necessary) will be conducted as part of this removal action to achieve the risk-based goals.

CHAPTER 3.0

DESCRIPTION OF SITE REMOVAL ACTION PLAN

The removal action developed for the site is based on achieving the EPA removal action goals and will be expanded, as needed to achieve risk-based goals defined by a site-specific risk assessment. The removal action consists of the following activities:

1. Preparation and implementation of a community relations activity plan to address public notification activities.

2. Preparation of a risk assessment to define risk-based removal goals for soil and groundwater.

3. Characterization of onsite and potential offsite groundwater contamination.

4. Characterization and offsite disposal of the waste oil contained in the four above ground tanks.

5. Decontamination of waste oil tanks, and offsite disposal of the tanks as scrap metal.

6. Characterization and offsite disposal of the drummed wastes.

7. Offsite disposal of the debris from the warehouse fire.

8. Demolition of office building, metal building, and concrete slabs for offsite disposal.

9. Removal of inert debris from the site for disposal.

10. Removal of elevated water storage tank for offsite disposal as scrap metal.

11. Excavation of shallow soils (depth of 0 to 1 foot below land surface) with total chlorinated pesticide concentrations of 50 mg/kg or greater, and deep soils (depth of 1 foot to groundwater) with total chlorinated pesticide concentrations of 100 mg/kg or greater. Groundwater is encountered at a depth of approximately 6 to 8 feet below land surface at the site. The excavated soil will be hauled by truck to a Chemical Waste Management facility for disposal. A total of approximately 3,800 cubic yards of soil will be excavated and disposed of.

12. Dewatering may be performed in the vicinity of the rinsate ponds to facilitate deeper excavation to achieve risk-based goals. Collected groundwater will be routed to an onsite groundwater treatment system. The treatment system will consist of physical/chemical pretreatment followed by air stripping for removal of volatile organic compounds, and activated carbon adsorption for removal of pesticides. Treated groundwater will be discharged to an exfiltration trench on the south side of the site.

13. Following soil excavation and removal, an onsite pilot test of a proprietary soil treatment method may be performed. Bench-scale testing results and a description of the pilot test will be submitted to EPA for review and approval, should onsite treatment prove viable.

14. If the onsite treatment method is not selected for use, the remaining soils will be excavated to achieve the risk-based removal goals, and transported to a Chemical Waste Management disposal facility.

15. The site will be backfilled with imported, clean, native soil, and regraded and revegetated.

16. Based on the results of the groundwater investigation, a groundwater remediation system may be designed and constructed. The system may include a groundwater treatment system similar to that described under activity 12 above.

17. Verification monitoring will be conducted at the conclusion of all removal activities to verify that the removal action is complete.

CHAPTER 4.0

REMOVAL ACTION TASKS

The removal action tasks to be conducted at the Chevron Orlando site will be completed in the following stages:

1. Preconstruction activities;
2. Demolition, site preparation, excavation of soils;
3. Excavation of soils for onsite treatment (optional);
4. Site restoration; and
5. Groundwater recovery and treatment.

Each stage, with associated tasks, is described in detail below.

4.1 PRECONSTRUCTION ACTIVITIES

Several preconstruction tasks have occurred or will occur before onsite construction is initiated. The pre-construction activities include:

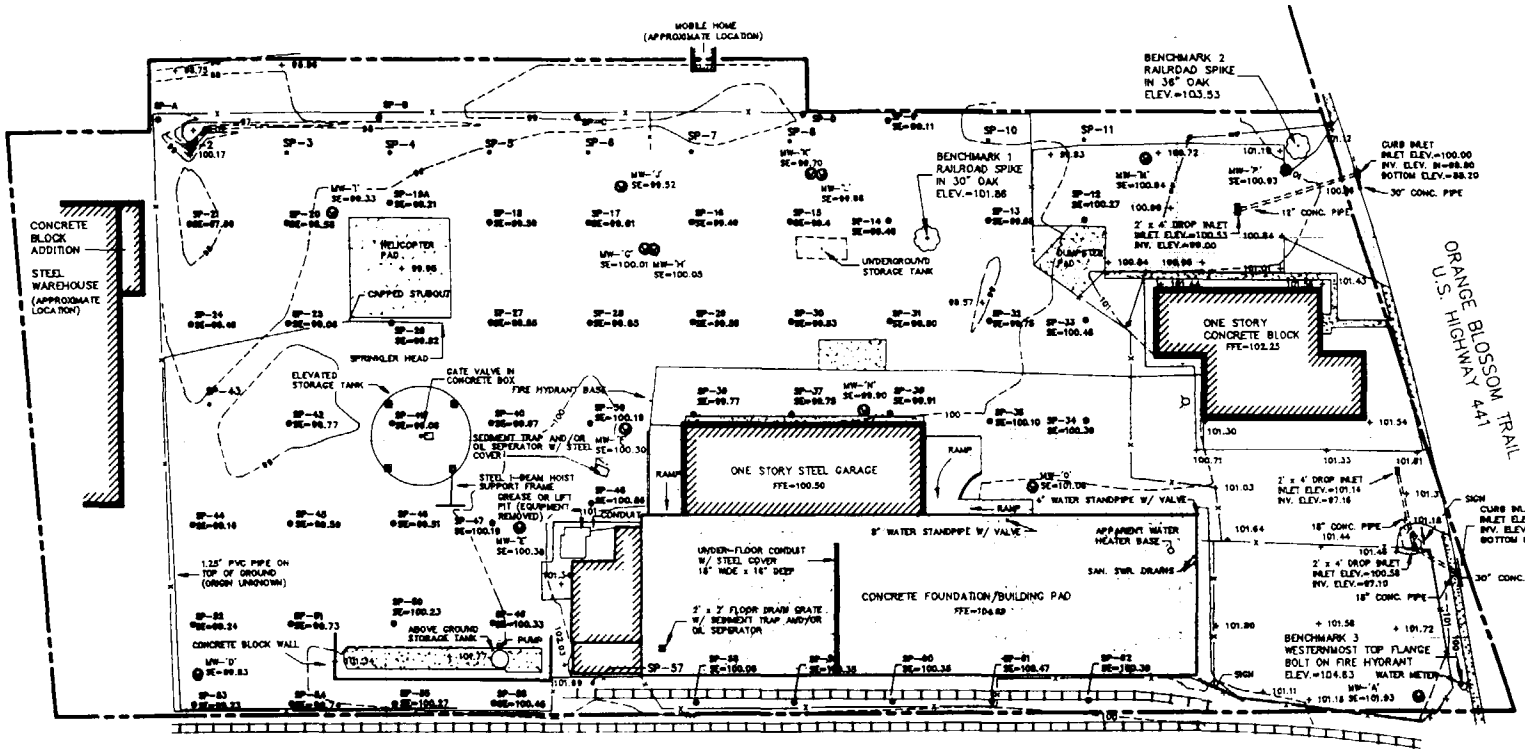
- Site Surveying
- Additional Sampling and Analysis
- Site Control
- Community Relations
- Additional Groundwater Investigation
- Risk Assessment
- Access Agreements
- Waste Characterization and Generator ID Number
- Contractor Procurement

Site surveying, additional sampling and analysis, and site control measures were accomplished prior to preparation of this RAP. The remaining activities will be completed prior to initiation of the demolition and excavation activities described in Section 4.2.

4.1.1 Surveying

A topographic survey of the site was conducted on June 10, 1991 to define site topography and to accurately locate and depict site structures and features. The survey was also used to establish a 50 by 50-foot grid across the site to guide additional soil sampling activities. The survey was conducted by Tribble and Richardson and is presented as Figure 4-1.

See Figure 4-1



SAMPLING POINT COORDINATE/ELEVATION TABLE

NUMBER	NORTHING	EASTING	ELEVATION
1	NOT SET	NOT SET	NOT SET
* 2	1,543,744.04	524,803.04	98.36
* 3	1,543,744.09	524,853.23	98.58
* 4	1,543,744.15	524,903.23	97.30
* 5	1,543,744.20	524,953.23	98.29
* 6	1,543,744.25	525,003.23	98.83
* 7	1,543,744.31	525,053.23	98.87
* 8	1,543,740.38	525,103.23	98.99
9	1,543,758.45	525,153.23	99.01
* 10	1,543,748.47	525,203.23	100.35
* 11	1,543,748.52	525,253.23	100.44
12	1,543,709.52	525,253.28	100.27
13	1,543,709.47	525,203.28	99.88
14	1,543,709.42	525,153.28	99.48
15	1,543,709.36	525,103.28	99.40
16	1,543,709.31	525,053.28	99.99
17	1,543,709.25	525,003.28	99.81
18	1,543,709.20	524,953.28	99.38
18A	1,543,719.15	524,903.27	99.21
20	1,543,709.09	524,853.28	98.38
21	1,543,709.04	524,803.28	97.86
22	NOT SET	NOT SET	NOT SET
23	NOT SET	NOT SET	NOT SET
24	1,543,859.04	524,803.33	98.46
25	1,543,859.09	524,853.33	99.08
26	1,543,859.15	524,903.33	99.52
27	1,543,859.20	524,953.33	99.85
28	1,543,859.25	525,003.33	99.85
29	1,543,859.31	525,053.33	99.36
30	1,543,859.36	525,103.33	99.53
31	1,543,859.42	525,153.33	99.80
32	1,543,859.47	525,203.33	99.75
33	1,543,859.52	525,253.33	100.46
34	1,543,809.52	525,253.39	100.38
35	1,543,809.47	525,203.39	100.10
36	1,543,813.42	525,153.38	99.91
37	1,543,813.36	525,103.38	99.75
38	1,543,813.31	525,053.38	99.77
39	1,543,809.25	525,003.39	100.18
40	1,543,809.20	524,953.39	99.87
41	1,543,809.15	524,903.39	99.08
42	1,543,809.09	524,853.39	98.77
* 43	1,543,813.04	524,813.39	99.88
44	1,543,589.04	524,803.44	99.16
45	1,543,539.08	524,853.44	99.39
46	1,543,589.15	524,903.44	99.31
47	1,543,589.20	524,953.44	100.19
48	1,543,589.25	525,003.43	100.86
49	1,543,589.19	524,953.49	100.33
50	1,543,589.14	524,903.49	100.23
51	1,543,589.09	524,853.50	99.73
52	1,543,589.04	524,803.50	99.24
53	1,543,489.04	524,803.54	99.23
54	1,543,489.09	524,853.54	99.74
55	1,543,489.15	524,903.54	100.27
56	1,543,489.20	524,953.54	100.65
* 57	1,543,479.25	525,003.54	99.90
58	1,543,489.31	525,053.54	100.06
59	1,543,489.36	525,103.54	100.35
60	1,543,489.42	525,153.54	100.36
61	1,543,489.47	525,203.54	100.47
62	1,543,489.52	525,253.54	100.38
* A	1,543,781.04	524,788.10	97.35
* B	1,543,781.87	524,898.10	98.55
* C	1,543,781.33	524,998.20	99.11
* D	1,543,782.96	525,110.20	99.06

* MOVED DURING FIELD INVESTIGATION
ELEVATIONS ARE APPROXIMATE.

NOTES

1. ELEVATIONS SHOWN ARE FEET ABOVE MEAN SEA LEVEL.
2. COORDINATE VALUES FOR ALL POINTS AND FEATURES SHOWN ON THIS DRAWING ARE REFERENCED TO THE FLORIDA STATE PLANE COORDINATE SYSTEM AND HAVE BEEN SUPPLIED SEPERATELY IN DIGITAL FORMAT.
3. TIES TO MEAN SEA LEVEL VERTICAL DATUM AND FLORIDA STATE PLANE HORIZONTAL DATUM ARE REFERENCED TO INFORMATION FROM PREVIOUS SURVEYS BY OTHERS AS PROVIDED TO TRIBBLE & RICHARDSON, INC. BY BROWN AND CALDWELL CONSULTANTS.
4. PROPERTY LINES SHOWN HEREON ARE BASED ON INFORMATION PROVIDED BY BROWN AND CALDWELL CONSULTANTS AND THE ORANGE COUNTY, FLORIDA TAX ASSESSOR'S OFFICE. NO BOUNDARY SURVEY OF THE SUBJECT PROPERTY WAS PERFORMED AT THE TIME OF THIS TOPOGRAPHIC SURVEY. TRIBBLE & RICHARDSON, INC. ASSUMES NO LIABILITY FOR THE ACCURACY OF THE PROPERTY LINES AS SHOWN ON THIS DRAWING.
5. APPARENT ENCROACHMENTS TO THIS PROPERTY WERE NOTED IN AREAS OUTSIDE THE FENCE ON THE WEST AND NORTH SIDES. THOSE APPARENT ENCROACHMENTS INCLUDE A WAREHOUSE BUILDING (AS SHOWN) TO THE WEST AND VARIOUS MINOR IMPROVEMENTS INCLUDING OUTBUILDING, WALKS AND AT LEAST ONE MOBILE HOME (AS SHOWN) TO THE NORTH. ACCESS TO THE PROPERTY LYING OUTSIDE THE FENCE TO THE WEST WAS DENIED BY THE MANAGER OF THE WAREHOUSE OCCUPYING THIS AREA.
6. AREAS INDICATED ON THIS DRAWING AS CONCRETE REPRESENT EXPOSED CONCRETE IN GOOD CONDITION. A LARGE PORTION OF THE SITE IS COVERED WITH OLD, DETERIORATED CONCRETE, NOW COVERED WITH VEGETATION IN MOST AREAS. NO EFFORT WAS MADE TO DETERMINE OR SHOW ON THIS DRAWING THE LIMITS OF THIS OLD CONCRETE.
7. THIS DRAWING WAS PREPARED UTILIZING COMPUTER AIDED DRAFTING (CAD) AND HAS BEEN PROVIDED IN DIGITAL FORMAT ON FLOPPY DISK. ORIGINAL PLOTS OF THE DRAWING HAVE BEEN PROVIDED WITH THE DIGITAL FILES AND ALSO PLACED ON FILE AT THE OFFICE OF TRIBBLE & RICHARDSON, INC.
8. DATE OF SURVEY: JUNE 10-13, 1991.

LEGEND

PROPERTY LINE	
EXISTING CONTOUR	
UTILITY POLE	
OVERHEAD POWER	
MONITORING WELL	MW-'A'
SAMPLING POINT	SP-31
FIRE HYDRANT	
SURFACE ELEVATION	SE=101.83
SPOT ELEVATION	102.03 +
CONCRETE	
ASPHALT	

SCALE: 1" = 60'

FIGURE 4-1

TOPOGRAPHIC SURVEY OF
CHEVRON SITE
PREPARED FOR
BROWN AND CALDWELL CONSULTANTS

SECTION 9 TOWNSHIP 22S RANGE
ORLANDO ORANGE COUNTY FLOR

DSGN: -
DRWN: JWH
CHKD: JMS
APVD: -

TRIBBLE & RICHARDSON INC

DATE: 28 JUNE 1991
SCALE: 1"=30'
PROJ NO.: 1398-011-01
FIELD BOOK: SDR/1248

SHEET 1 OF 1

2 4 0023

4.1.2 Additional Sampling and Analysis

Additional soil sampling was conducted from June 12 through June 19, 1991 to define soil characteristics and to better define the distribution of organochlorine pesticides at the site. Soil samples were collected at the grid points established during the preconstruction survey described above. With the exception of sample locations A, B, C, D, E, G, and H, samples were collected from three depth intervals: 2-4 feet below land surface (BLS), 4-6 feet BLS, and 8-10 feet BLS. Locations A, B, C, and D were sampled from 1-2 feet BLS, location G was sampled as sediment from the drainage trench that transects the floor of the upper level building foundation, and locations E and H were sampled in the 2-4 foot interval beneath the lower and upper level foundations, respectively. All sample locations are presented on Figure 4-1.

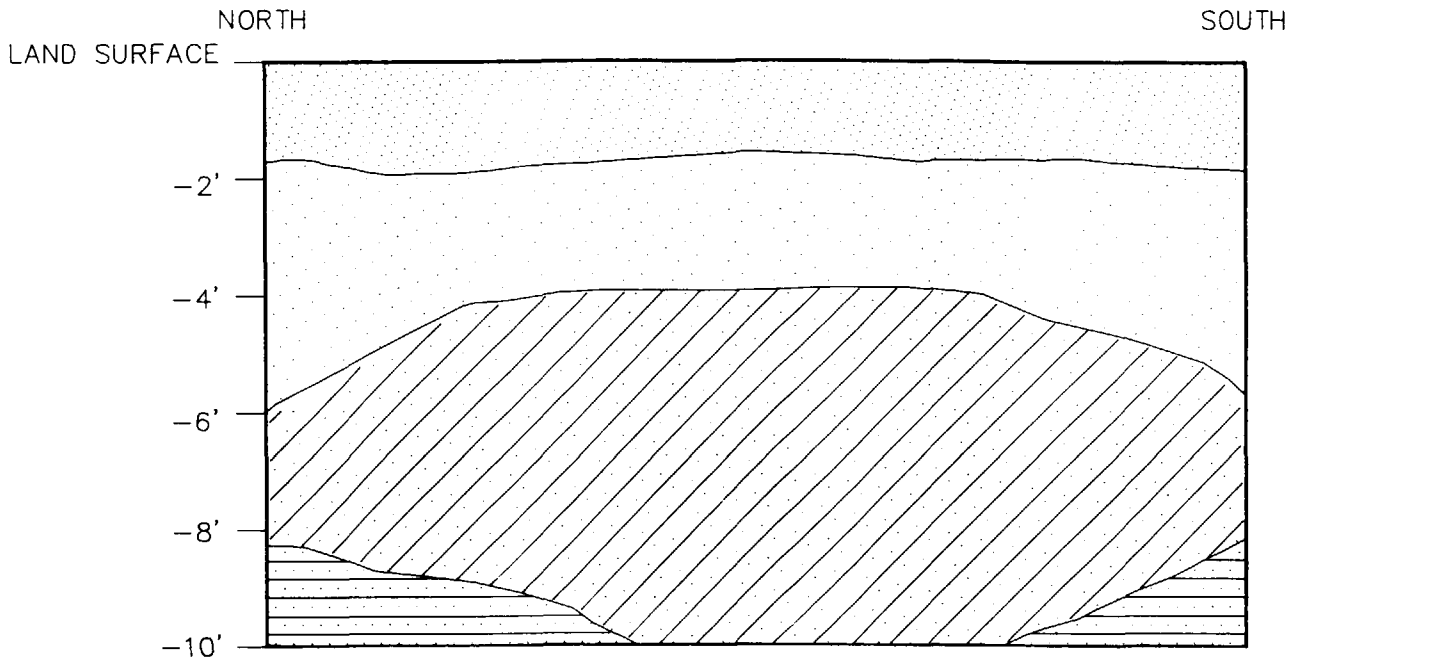
Soil sampling was accomplished using a split-spoon sampler mounted on a Mobil B-57 drill rig. Prior to sampling at each sample location, the split-spoon samplers and associated drive rod were decontaminated with high pressure steam, a tap water/detergent wash, an analyte-free water rinse, and a pesticide-grade isopropyl alcohol rinse. The split-spoons were then allowed to air-dry.

The split-spoon samplers were assembled, with a polybyrate liner, and driven to the desired sample depth. The liners were removed and the contents were visually evaluated and logged by a Brown and Caldwell geologist. These boring logs are presented in Appendix B.

The surficial geology at the Chevron Orlando site consists of approximately 2 feet of black sandy topsoil followed by 2 to 4 feet of dark brown to dark gray-brown fine-grained sand. A silty sand occurs at 4 to 6 feet BLS and an occasional gray, stiff, clayey sand/sandy clay occurs at approximately 9 to 10 feet below grade. The silty and clayey sands extend to 33 feet BLS where a medium gray stiff clay or silty clay is encountered. These sands and clays are unconsolidated sediments of Pleistocene to recent age.

A geologic cross-section of the upper 10 feet of sediments across the site is included as Figure 4-2. This cross section is compiled from data gathered during the June 1991 soil sampling event.

See Figure 4-2



LEGEND

- BLACK SANDY TOP SOIL
- DARK BROWN FINE GRAINED SAND
- DARK BROWN SILTY SAND
- GREY CLAYEY SAND/SANDY CLAY

Brown and Caldwell Consultants	FILE FIG4-2.DWG DRAWN M.G.D. DESIGNED N/A CHECKED S.L.K.	LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)	CHEVRON CHEMICAL COMPANY CHEVRON SITE – ORLANDO	**FIGURE 4–2. GEOLOGIC CROSS SECTION**

See Tables 4-1 and 4-2

Following description of each sample, the sample was transferred to a mixing pan, mixed well, placed in labeled sample containers, and transferred to an onsite laboratory for analysis of chlordane, DDD, and DDT by a modified SW-846 Method 8080. Samples A, B, C, and D were also analyzed for all of the Method 8080 parameters by Pace, Inc. in Tampa, Florida. Initially, the 2 to 4-foot and 4 to 6- foot sample intervals for each sample location were analyzed. Analysis was then performed on the 8 to 10-foot interval if pesticides were detected in the 4 to 6-foot interval. The analytical results for the onsite laboratory are presented in Table 4-1. Analytical results for samples A, B, C, and D are presented in Table 4-2. Additional samples were selected from locations that were relatively free from pesticides and delivered to a geotechnical laboratory for determination of bulk density, particle size distribution, porosity, and total organic carbon content. The results of this analysis and all laboratory analytical reports are presented in Appendix C.

See Table 4-3

Samples were collected from three existing wells and analyzed for calcium, sodium, magnesium, manganese, iron, chloride, sulfate, nitrate, total hardness, total dissolved solids, and total organic carbon. The results of these analyses are presented in Table 4-3.

During groundwater sample collection, a floating non-aqueous phase liquid (NAPL) layer approximately 8-inches thick was detected in the shallow well in the vicinity of the rinsate pond. A sample of this liquid was collected and analyzed for product characterization by Method 8015. The NAPL was also analyzed in the onsite laboratory, with up to 964 mg/l total organochlorine pesticides detected. The NAPL is composed of a mixture of weathered gasoline and diesel fuel.

See Tables 4-4 and 4-5

Thirteen groundwater and sediment samples were collected to provide data to facilitate calculation of the partition coefficient for chlordane, DDD, and DDT. The samples were collected through temporary piezometers, and centrifuged onsite. The liquid phase and solid phase of each sample were analyzed by the onsite laboratory. Analytical results for these samples are presented in Table 4-4.

The resultant moisture corrected partition data for DDD is presented in Table 4-4. Data points were selected to provide a range of values, and to avoid sample locations with visible non-aqueous phase liquid. Values for DDD were linearized by least squares analysis, and Kd value of 8.9 was calculated with a correlation coefficient (r^2) of 0.92. Determination of Kd for chlordane and DDT were not possible due to the erratic nature of the data.

Based on the field observations and analytical results, it is apparent that the chlorinated pesticides in the rinsate pond area have been solubilized by the weathered gasoline/diesel fuel NAPL. As a result, contaminant transport from this area has been enhanced.

Table 4-1.
Chevron Orlando Soil Sampling Analytical Results
Sampling Conducted June 12 through 19, 1991

Sample Location I.D.	Depth Interval (feet)	Gamma Chlordane (mg/kg)	Alpha Chlordane (mg/kg)	DDD (mg/kg)	DDT (mg/kg)
02	2-4	nd	nd	nd	nd
02	4-6	nd	nd	nd	nd
03	2-4	nd	nd	nd	nd
03	4-6	nd	nd	nd	nd
04	2-4	nd	nd	nd	nd
04	4-6	nd	nd	nd	nd
05	2-4	15	nd	12	nd
05	4-6	nd	nd	nd	nd
06	2-4	28	15	50	nd
06	4-6	18	nd	56	nd
06	6-8	16	12	58	nd
06	8-10	nd	nd	30	nd
07	2-4	11	nd	32	nd
07	4-6	nd	nd	20	nd
07	8-10	nd	nd	14	nd
08	2-4	nd	nd	nd	nd
08	4-6	nd	nd	nd	nd
08dup	2-4	nd	nd	nd	nd
09	2-4	nd	nd	nd	nd
09	4-6	nd	nd	nd	nd
10	2-4	nd	nd	nd	nd
10	4-6	nd	nd	nd	nd
11	2-4	nd	nd	nd	nd
11	4-6	nd	nd	nd	nd
12	2-4	nd	nd	nd	nd
12	4-6	nd	nd	nd	nd
13	2-4	nd	nd	nd	nd
13	4-6	nd	nd	nd	nd
14	2-4	nd	nd	nd	nd
14	4-6	nd	nd	nd	nd
15	2-4	nd	nd	29	nd
15	4-6	nd	nd	nd	nd
16	2-4	32	18	110	19
16	4-6	13	nd	56	nd
16	6-8	16	nd	56	14
16	8-10	nd	nd	34	nd
17	2-4	58	28	28	10
17	4-6	200	95	290	120
17	8-10	97	45	150	76
18	2-4	27	11	nd	nd
18	4-6	12	nd	60	nd
18	6-8	nd	nd	12	nd
18	8-10	nd	nd	19	nd

Brown and Caldwell Consultants, July 1991

Table 4-1. (Continued)
Chevron Orlando Soil Sampling Analytical Results
Sampling Conducted June 12 through 19, 1991

Sample Location I.D.	Depth Interval (feet)	Gamma Chlordane (mg/kg)	Alpha Chlordane (mg/kg)	DDD (mg/kg)	DDT (mg/kg)
19	2-4	nd	nd	nd	nd
19	4-6	nd	nd	nd	nd
19	6-8	nd	nd	nd	nd
20	2-4	nd	nd	nd	nd
20	4-6	nd	nd	nd	nd
20	8-10	nd	nd	nd	nd
21	2-4	nd	nd	nd	nd
21	4-6	nd	nd	nd	nd
21	8-10	nd	nd	nd	nd
24	2-4	nd	nd	nd	nd
24	4-6	18	10	23	nd
24	8-10	nd	nd	nd	nd
25	2-4	nd	nd	nd	nd
25	4-6	nd	nd	nd	nd
25dup	2-4	nd	nd	nd	nd
26	2-4	nd	nd	nd	nd
26	4-6	nd	nd	nd	nd
27	2-4	23	nd	45	nd
27	4-6	14	nd	53	nd
27	6-8	nd	13	15	nd
27	8-10	13	nd	25	nd
28	2-4	33	21	nd	nd
28	4-6	170	74	220	93
28	6-8	140	65	220	130
28	8-10	170	79	260	180
28dup	2-4	31	21	nd	nd
29	2-4	13	nd	100	nd
29	4-6	10	nd	89	nd
29	6-8	nd	nd	59	nd
29	8-10	nd	nd	17	nd
30	2-4	nd	nd	36	nd
30	4-6	11	nd	55	nd
30	6-8	nd	nd	32	nd
31	2-4	nd	nd	nd	nd
31	4-6	nd	nd	nd	nd
31dup	2-4	nd	nd	nd	nd
32	2-4	nd	nd	nd	nd
32	4-6	nd	nd	nd	nd
33	2-4	nd	nd	nd	nd
33	4-6	nd	nd	nd	nd
33	8-10	nd	nd	nd	nd
34	2-4	nd	nd	nd	nd
34	4-6	nd	nd	nd	nd

Table 4-1. (Continued)
Chevron Orlando Soil Sampling Analytical Results
Sampling Conducted June 12 through 19, 1991

Sample Location I.D.	Depth Interval (feet)	Gamma Chlordane (mg/kg)	Alpha Chlordane (mg/kg)	DDD (mg/kg)	DDT (mg/kg)
35	2-4	nd	nd	nd	nd
35	4-6	nd	nd	nd	nd
35dup	2-4	nd	nd	nd	nd
36	2-4	nd	nd	nd	nd
36	4-6	nd	nd	nd	nd
37	2-4	11	nd	38	nd
37	4-6	17	11	63	23
37	6-8	14	nd	nd	14
37	8-10	nd	nd	34	nd
38	2-4	nd	nd	nd	nd
38	4-6	nd	nd	12	nd
38	6-8	nd	nd	28	nd
38	8-10	nd	nd	nd	nd
39	2-4	41	31	130	13
39	4-6	44	26	140	nd
39	6-8	53	40	160	31
39	8-10	65	45	150	43
40	2-4	nd	nd	nd	nd
40	4-6	nd	nd	nd	nd
41	2-4	19	nd	14	nd
41	4-6	nd	nd	nd	nd
42	2-4	nd	nd	nd	nd
42	4-6	nd	nd	nd	nd
43	2-4	nd	nd	nd	nd
43	4-6	nd	nd	nd	nd
44	2-4	nd	nd	nd	nd
44	4-6	nd	nd	nd	nd
45	2-4	nd	nd	nd	nd
45	4-6	nd	nd	nd	nd
46	2-4	nd	nd	nd	nd
46	4-6	nd	nd	nd	nd
47	2-4	nd	md	nd	nd
47	4-6	nd	nd	nd	nd
48	2-4	nd	nd	nd	nd
48	4-6	nd	nd	nd	nd
49	2-4	nd	nd	nd	nd
49	4-6	nd	nd	nd	nd
50	2-4	nd	nd	nd	nd
50	4-6	nd	nd	nd	nd
51	2-4	nd	nd	nd	nd
51	4-6	nd	nd	nd	nd
52	2-4	nd	nd	nd	nd
52	4-6	nd	nd	nd	nd

Table 4-1. (Continued)
Chevron Orlando Soil Sampling Analytical Results
Sampling Conducted June 12 through 19, 1991

Sample Location I.D.	Depth Interval (feet)	Gamma Chlordane (mg/kg)	Alpha Chlordane (mg/kg)	DDD (mg/kg)	DDT (mg/kg)
53	2-4	nd	nd	nd	nd
53	4-6	nd	nd	nd	nd
53dup	2-4	nd	nd	nd	nd
54	2-4	nd	nd	nd	nd
54	4-6	nd	nd	nd	nd
55	2-4	nd	nd	nd	nd
55	4-6	nd	nd	nd	nd
56	2-4	nd	nd	nd	nd
56	4-6	nd	nd	nd	nd
57	2-4	nd	nd	nd	nd
57	4-6	nd	nd	nd	nd
58	2-4	nd	nd	nd	nd
58	4-6	nd	nd	nd	nd
58dup	2-4	nd	nd	nd	nd
59	2-4	nd	nd	nd	nd
59	4-6	nd	nd	32	nd
59	6-8	nd	nd	46	nd
59	8-10	nd	nd	nd	nd
59dup	2-4	nd	nd	nd	nd
60	2-4	nd	nd	nd	13
60	4-6	nd	nd	nd	11
60	8-10	nd	nd	nd	nd
61	2-4	nd	nd	nd	nd
61	4-6	nd	nd	nd	nd
61dup	2-4	nd	nd	nd	nd
62	2-4	nd	nd	nd	nd
62	4-6	nd	nd	nd	nd
A	1-2	64	30	nd	nd
B	1-2	nd	nd	nd	nd
C	1-2	38	18	nd	nd
D	1-2	50	31	12	31
E	2-4	nd	nd	nd	nd
G	2-4	nd	nd	32	nd
H	2-4	nd	nd	nd	nd

nd = Below detectable limits (10 mg/kg)

Table 4-2.
Laboratory Soil Analytical Results*
Sampling Conducted June 12 through 19, 1991

Compound	Units	SPT-A-01	SPT-B-01	SPT-C-01	SPT-D-01
a-BHC	mg/kg	nd	nd	nd	nd
B-BHC	mg/kg	nd	nd	nd	nd
g-BHC	mg/kg	nd	nd	nd	nd
d-BHC	mg/kg	nd	nd	nd	nd
Heptachlor	mg/kg	nd	nd	nd	nd
Aldrin	mg/kg	nd	nd	nd	nd
Heptachlor Epoxide	mg/kg	nd	nd	nd	nd
Endosulfan	mg/kg	nd	nd	nd	nd
Dieldrin	mg/kg	nd	nd	nd	nd
Endrin	mg/kg	nd	nd	nd	nd
4,4-DDD	mg/kg	nd	nd	nd	nd
Endosulfan II	mg/kg	nd	nd	nd	nd
4,4-DDT	mg/kg	nd	nd	nd	nd
4,4-DDE	mg/kg	nd	nd	nd	nd
Endrin Aldehyde	mg/kg	nd	nd	nd	nd
Endosulfan Sulfate	mg/kg	nd	nd	nd	nd
Chlordane	mg/kg	230	3	160	150
Toxaphene	mg/kg	nd	nd	nd	nd

* = SW846 Method 8080 for Organochlorine Pesticides
nd = below detectable limits

Table 4–3.
Chevron Orlando Inorganic Groundwater Sampling Analytical Results
Sampling Conducted June 19, 1991

Analytical Parameter	Units	MDL	MW–L	MW–J	MW–N
Calcium	mg/L	0.2	15	14	18
Chloride	mg/L	1.0	170	86	16
Hardness, Total	mg/L	1	18	2.6	38
Iron	mg/L	0.3	8.9	8.8	2.5
Magnesium	mg/L	0.02	2.7	3.3	2.8
Manganese	mg/L	0.05	ND	ND	ND
Nitrogen, Nitrate	mg/L	1.0	ND	ND	ND
Sodium	mg/L	1	140	60	14
Solids, Total	mg/L	5	4900	7400	1700
Solids, Total Dissolved	mg/L	5	1400	2400	340
Sulfate	mg/L	5	49	14	17
Total Organic Carbon	mg/L	1.0	200	130	46

Note:
MDL – Method Detection Limit
MW – Groundwater Monitoring Well
ND – Not detected at or above the MDL.

Table 4-4. Kd Sample Analytical Results

Sample	Soil Phase (mg/kg)				Aqueous Phase (mg/l)				Non-Aqueous Phase (mg/l)			
ID	g-Chlordane	a-Chlordane	DDD	DDT	g-Chlordane	a-Chlordane	DDD	DDT	g-Chlordane	a-Chlordane	DDD	DDT
Kd-06	17	9.3	71	3.3	nd	nd	nd	nd	nd	nd	3.8	nd
Kd-16	4.7	3	20	1.9	3.1	1.8	11	3.4	na	na	na	na
Kd-18	5.8	3.7	26	1.5	2.6	1.8	13	1	na	na	na	na
Kd-19	nd	nd	nd	nd	nd	nd	nd	nd	na	na	na	na
Kd-27	2	1.7	12	nd	2.5	1.5	9.4	0.65	na	na	na	na
Kd-28	22	3.1	20	28	nd	nd	6	7.3	na	na	na	na
Kd-29	4	2.2	35	nd	3.3	1.9	26.8	1.1	na	na	na	na
Kd-30	2.2	nd	7.3	nd	1.7	0.87	7.6	0.51	10.2	6.8	61	nd
Kd-37	5.8	5.1	23	9.1	20	12	67	11	9.3	5.9	34	16
Kd-38	7.9	4	27	nd	7.8	2	18.5	4.3	na	na	na	na
Kd-39	52	37	134	32	4.9	3.5	17	1.1	386	178	768	196
Kd-59	4.5	2.9	29	2.8	0.93	0.74	8.1	0.4	4.2	36	350	22
Kd-60	8	5.6	12	27	1.5	1.1	4.4	4.7	na	na	na	na

nd = below detectable limits
na = not analyzed

Table 4-5. Kd Calculation for DDD

Sample ID	X/M (mg/kg)	Ceq (mg/l)	log(X/M)	log(Ceq)	Predicted X/M (mg/kg)
Kd-16	26.25	11	1.41	1.04	26.33
Kd-18	31.05	13	1.49	1.11	28.40
Kd-28	22.47	6	1.35	0.77	20.01
Kd-29	37.18	26.9	1.57	1.42	39.46
Kd-38	33.16	18.5	1.52	1.26	33.32
Kd-60	15.41	4.4	1.18	0.64	17.39

X/M = Moisture corrected sorbed mass per kilogram soil
Ceq = Equilibrium concentration in aqueous phase

Regression Output, log(Ceq) vs log(X/M):			
Constant	0.95	= log(Kd);	Kd = 8.9
Std Err of Y Est	0.04		
R Squared	0.92		
No. of Observations	6		
Degrees of Freedom	4		
X Coefficient(s)	0.45		
Std Err of Coef.	0.07		

Infiltration rates were tested at three randomly chosen locations at the site using the falling head method. The results of these tests are presented in Figures 4-3, 4-4, and 4-5.

See Figures 4-3 thru 4-5

4.1.3 Site Control

The entire site is enclosed by a 6 foot high chain link fence with barbed wire at the top to prevent unauthorized access to the site prior to commencement of the removal action. Gates have been provided for authorized access only and keys to the gate padlocks are maintained by Brown and Caldwell personnel and Mr. Uttal. Signs have been placed on the fence at 50 foot intervals in accordance with the Florida Administrative Code, Chapter 17-736.

4.1.4 Community Relations

Community relations activities will be conducted in accordance with the procedures identified in 40 CFR Part 300.415(m). These activities will include:

1. Publish a notice of availability of the administrative record file established pursuant to 40 CFR Part 300.820 in a major local newspaper of general circulation within 60 days of initiation of onsite removal activities.

2. Provide public comment period of not less than 30 days from the time the administrative record file is made available for public inspection.

3. Prepare a written response to significant comments.

Community relations activities will be coordinated with the EPA designated on-scene coordinator (OSC). Local Community relations support will be provided by Todd Persons Communications, Inc., in conjunction with Chevron Chemical Company's public relations department.

4.1.5 Additional Groundwater Investigation

During the pre-construction soil characterization sampling, petroleum vapors were detected over a portion of the northern and western areas of the site. Due to the possible impact that petroleum-type hydrocarbons may have upon the mobility of otherwise relatively insoluble compounds, such as organochlorine pesticides, the approximate areal extent of volatile hydrocarbons in the soil will be determined.

A soil vapor survey will be conducted onsite by the following method:

- A vented shield point, connected to a teflon tube of sufficient length to reach above land surface, will be driven with a pneumatic hammer and protective hardened steel drive rod into the soil at each sample grid point discussed in

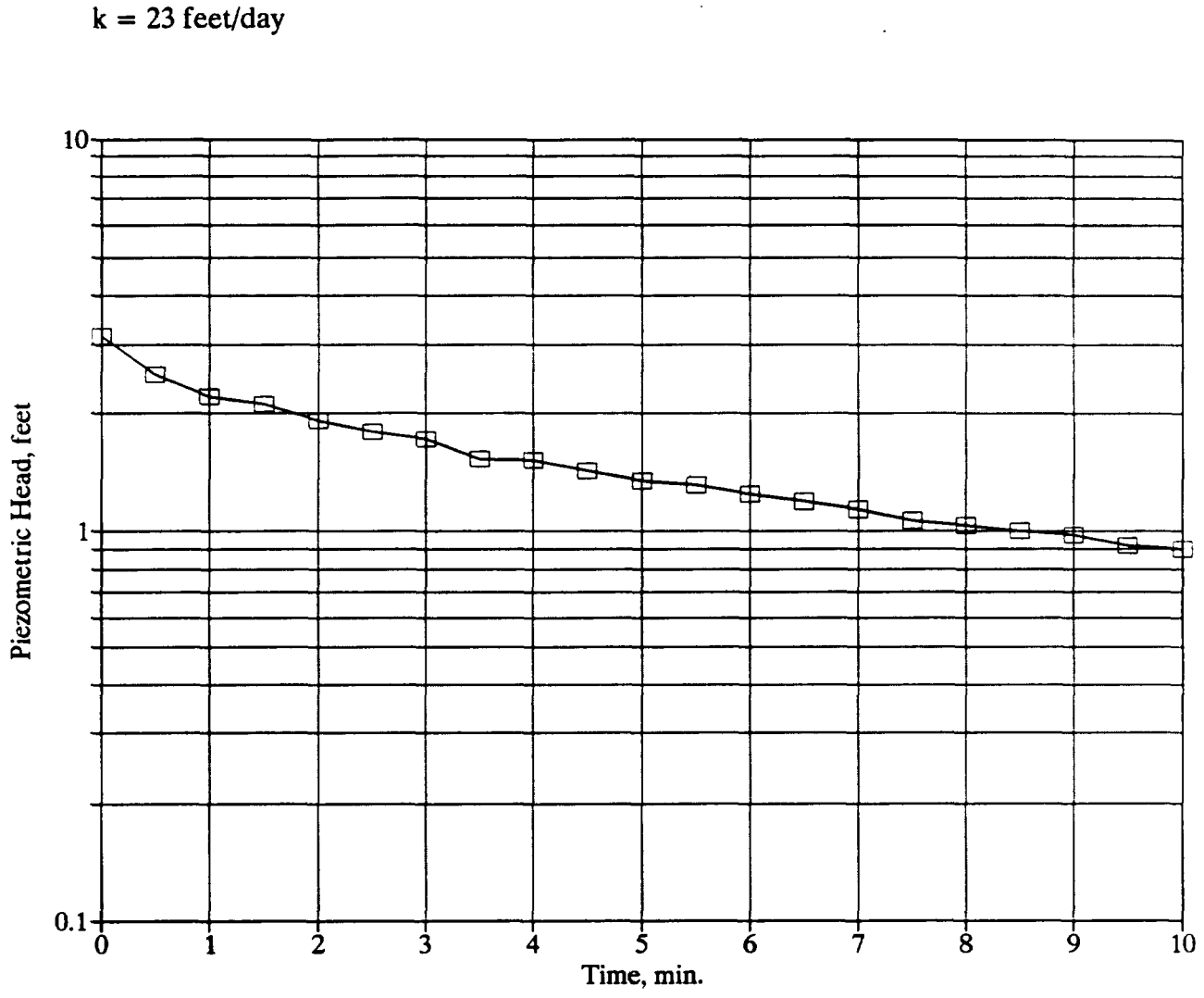


Figure 4-3. INFILTRATION TEST RESULTS - TEST 1
(10 ft. West of MW Cluster G & H)

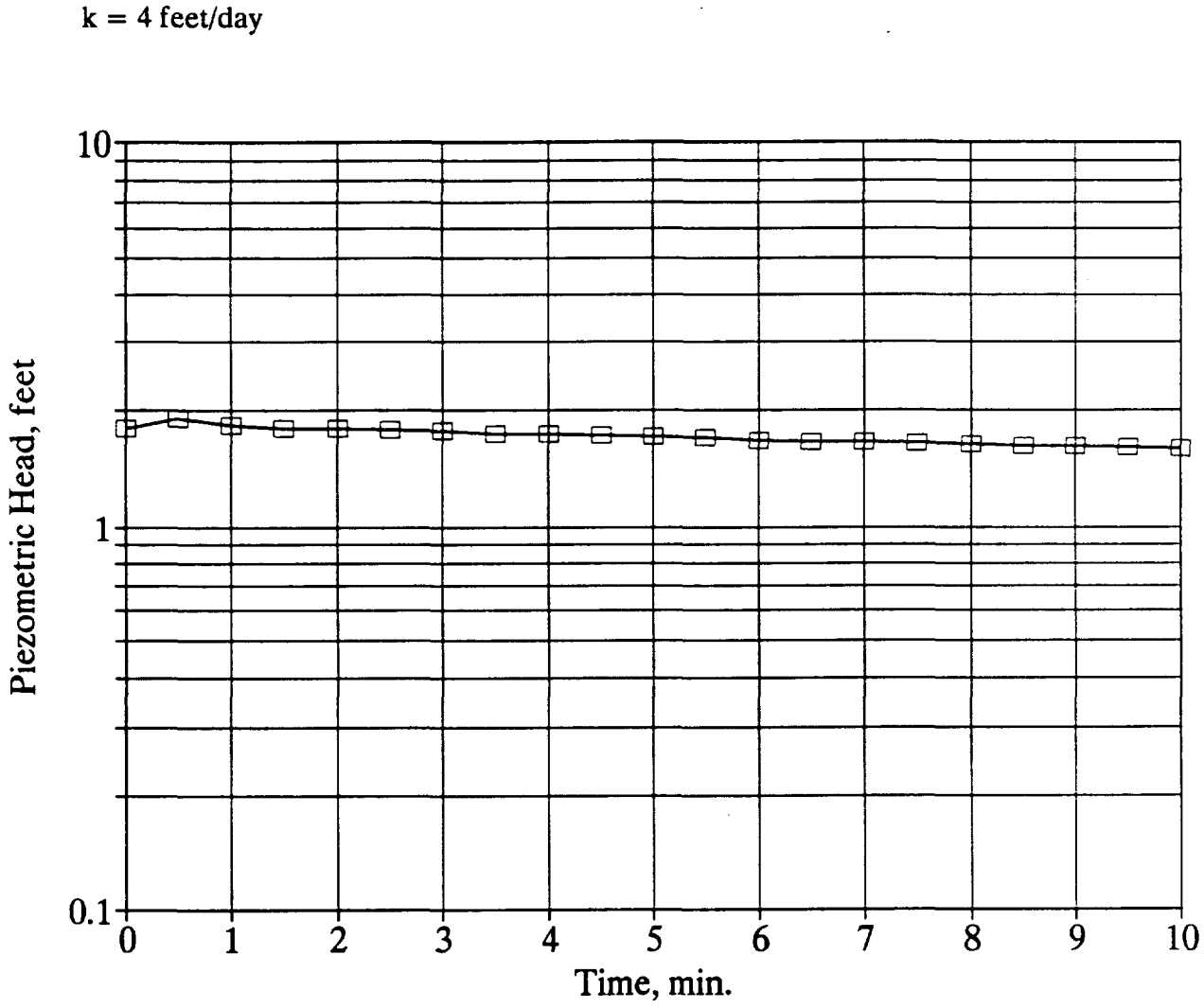


Figure 4-4. INFILTRATION TEST RESULTS - TEST 2
(5 ft. West of Sample Point 15)

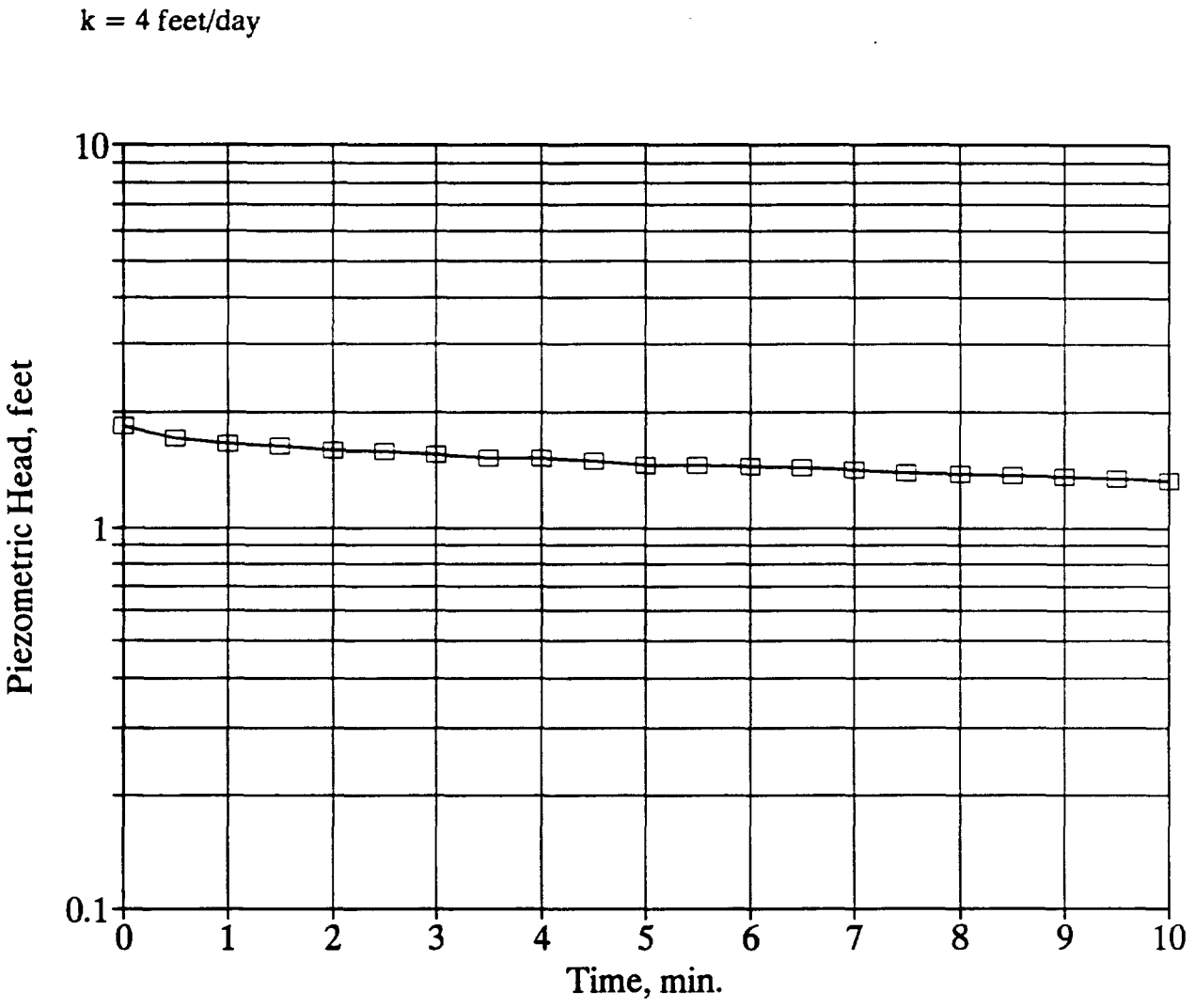


Figure 4-5. INFILTRATION TEST RESULTS - TEST 3
(25 ft. West of Water Tower)

Section 4.1 where petroleum odors were encountered to a depth just above the water table. The drive rod will then be withdrawn to expose the vented portion of the shield point.

- The volume of air within the teflon tube will be calculated based on the length of the tubing, and two air volumes will be removed using a 50 milliliter disposable syringe.

- An additional 50 milliliter volume of soil gas will be withdrawn, and analyzed for total volatiles using a Foxboro Organic Vapor Analyzer (OVA) and recorded.

The data generated by the soil vapor survey will be entered into a data file and concentration isopleths will be generated using software developed by Golden Software (Surfer) to determine approximate areal distribution of petroleum.

Additional off-site soil vapor sample points will be selected and analyzed moving outward from the areas where organic vapors are detected. These sample points will be continued on a 50-foot grid until the detectable boundary of petroleum distribution is determined, and may continue beyond the site boundaries.

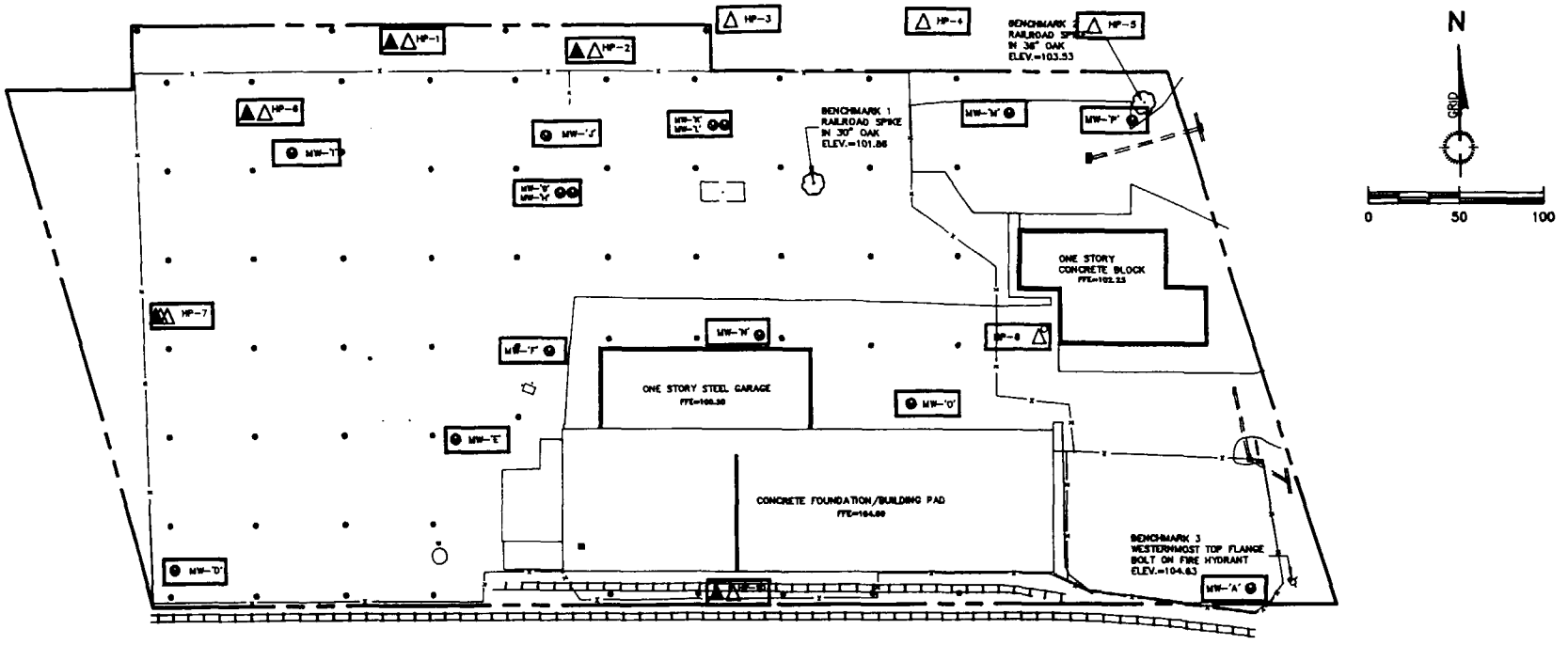
Groundwater sample collection and analysis utilizing a stainless steel hydropunch and on-site laboratory facilities will be conducted as a screening tool to determine the approximate extent of groundwater contamination. Hydropunch samples will be collected initially at 9 locations from a depth of approximately 10 to 15 feet and 4 locations from a depth of 25 to 30 feet, as shown on Figure 4-6. These initial hydropunch sample locations will be selected on the basis of groundwater gradient and contamination data generated during a previous investigation (BCC, 1990).

See Figure 4-6

The hydropunch samples will be collected by first drilling to just above the desired sample depth interval with a solid core continuous flight auger. The auger will be withdrawn and the hydropunch will be seated in the borehole and driven approximately 5 feet. The outer sleeve of the hydropunch will then be withdrawn slightly to expose the sampling chamber, and water samples will be collected by lowering a stainless steel bailer into the hydropunch.

Concurrent to the collection of the initial hydropunch samples, the existing monitor wells will be sampled and analyzed by the same field methods to provide additional relative data. All collected samples will be analyzed for chlorinated pesticides (modified SW-846 Method 8080) and volatile organics (Method 601/602).

Up to twelve additional shallow and four additional deep hydropunch samples will be collected and analyzed from locations selected sequentially on the basis of this data as it is generated, and of the results of the soil vapor survey described.



NOTES:

1. UP TO 12 ADDITIONAL SHALLOW AND 4 ADDITIONAL DEEP HYDROPUNCH SAMPLES WILL BE COLLECTED AT LOCATIONS TO BE DETERMINED IN THE FIELD.
2. BLS – BELOW LAND SURFACE

LEGEND

- △ HP-7 – DESIGNATES PROPOSED LOCATION FOR HYDROPUNCH SAMPLE FROM 10–15 FEET BLS
- ▲ HP-1 – DESIGNATES PROPOSED LOCATION FOR HYDROPUNCH SAMPLE FROM 25–30 FEET BLS
- ● MW-'J' – DESIGNATES EXISTING MONITOR WELL

SOURCE OF BASE MAP: TERRELL AND RICHARDSON, INC., 6/91

Brown and Caldwell Consultants	FILE FIG4-6.DWG DRAWN A.Q.L. DESIGNED P.J.L. CHECKED M.P.S.	1 INE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)	CHEVRON CHEMICAL COMPANY CHEVRON SITE – ORLANDO	FIGURE 4–6. INITIAL HYDROPUNCH SAMPLING LOCATIONS

Up to seven monitor well clusters consisting of one shallow (approximately 10 to 20-foot screened interval) and one deep (approximately 25 to 35-foot screened interval) will be installed at locations selected on the basis of the hydropunch sampling results. The wells will be installed using the hollow stem auger method and will be constructed of 2-inch inside diameter, threaded Schedule 40 PVC riser pipe with 10 feet of threaded, Schedule 40 PVC wire-wound .010 slot screen. No glue will be used during well construction.

The shallow wells will be installed so that the screened interval intersects the water table, and the deep wells will be installed to top of the underlying clay. The annular space will be backfilled with 6-20 washed silica sand to approximately 1-foot above the top of the screened interval. Pure Wyoming bentonite pellets will be added to the annular space to a minimum depth of 6 inches above to top of the sand pack. Analyte free water will be added to the bentonite if required, and the bentonite will be allowed to hydrate for 24 hours prior to grouting.

The annular space above the bentonite seal will be backfilled to the surface with Portland Type I cement containing 3 percent bentonite. At well completion, a locking, protective steel riser and 3-foot by 3-foot by 6-inch concrete antipercolation collar will be installed over the well casing.

Following well completion, all newly installed monitor wells will be developed by interrupted overpumping until free from all sand and other foreign material.

Sampling of all existing and newly installed monitor wells will be conducted a minimum of 5 days following new well installation to allow the new wells to reach equilibrium. Prior to sample collection, the wells will be tested with a clear teflon bailer for floating NAPL. Wells that do not contain free product will be purged with a pre-cleaned, closed-top stainless steel bailer of 3 to 5 volumes of water. During purging, pH, temperature, and specific conductance will be monitored. Samples will be collected immediately following purging and will be sent to an approved laboratory to be analyzed for volatile organics (EPA Method 601/602), organochlorine pesticides (SW 846 Method 8080), organophosphate pesticides (SW 846 Method 8140), and chromium and arsenic. Sampling methods, decontamination procedures, analytical methods, and sample handling procedures are described in detail in the Sampling and Analysis Plan. Wells containing free product will not be sampled.

The results of the additional groundwater investigation activities will be summarized in report format for submittal to EPA. If the results of the groundwater investigation (in conjunction with the risk assessment described below) demonstrate the necessity for groundwater recovery and treatment, then the groundwater recovery and treatment design will be included in the report.

4.1.6 Risk Assessment

A risk assessment will be performed to determine risk-based remedial goals for soil and groundwater at the site. The risk assessment will reflect probable post-removal action land use

and will evaluate both soil and groundwater contaminant migration exposure scenarios. The risk assessment will include the following subtasks:

- Identification of contaminants of concern (or indicator chemicals);
- Exposure assessment;
- Toxicity assessment; and
- Risk characterization.

A review of all analytical data will be performed to identify the contaminants of concern based on a number of factors including the intrinsic properties of the chemicals, their concentrations and distribution at the site, their detection frequency, their suspected volume, the potential risks to human health and the environment posed by their presence at the site, and their transport potential. In some cases, the review of the data may lead to the selection of indicator chemicals that are considered to present the most significant health and environmental risks at the site, and will most likely have the most influence on further site remediation.

An exposure assessment will be performed of the site to identify actual or potential exposure pathways, characterize potentially exposed receptor populations, and evaluate the actual or potential extent of exposure. This subtask will involve the estimation of receptor intakes or exposures to the contaminants of concern, and a comparison of the estimated intakes (or dosages) and exposures to appropriate health based standards.

The toxicity assessment for the contaminants of concern will involve an assessment of the types of adverse health or environmental effects associated with chemical exposures, the relationships between magnitude of exposures and adverse effects, and the related uncertainties for contaminant toxicity. Health effects to be considered will include chronic effects, as well as carcinogenic and systemic toxicity.

The risk characterization will integrate information developed during the exposure and toxicity assessments to characterize the current or potential risk to human health and/or the environment posed by the site. The characterization will identify the potential for adverse health or environmental effects for the contaminants of concern, and will also identify any uncertainties associated with the contaminants, toxicities, and/or exposure assumptions.

4.1.7 Access Agreements

Access agreements are required for removal activities along the rail spur and along the northern portion of the site. An access agreement will also be required for the proposed offsite groundwater investigation. Chevron Chemical Company has initiated dialogue with CSX Railroad and with the owner of the trailer park located to the north of the site. Access agreements must be finalized prior to initiation of the groundwater investigation and soil excavation. It may also be necessary to relocate a trailer which is currently located within the northern property boundary.

4.1.8 Waste Characterization and Generator ID Number

Soil samples were collected for waste characterization, and analyzed for toxicity characteristics leaching procedure (TCLP) organics and metals, and total halogenated organic compounds. The results of the waste characterization are presented in Table 4-6. Based on these results, the soils are not classified as hazardous waste. Waste characterization analysis is being redone on additional samples to confirm these results.

See Table 4-6

EPA Regulations for Hazardous Waste Generators (40 CFR 262) require that any person who generates hazardous waste acquire an EPA identification number in order to lawfully treat, dispose of, or offer for transport a hazardous waste. In turn, a hazardous waste generator must not offer the material for transport, or treatment, storage or disposal (TSD) to entities which have not received an EPA identification number.

An EPA identification number is obtained by completing EPA form 8700-12, Notification of Hazardous Waste Activity, and submitting the completed forms to the appropriate State or EPA Region. A generator located in Florida submits the completed 8700-12 form to:

Hazardous Waste Section
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

The 8700-12 form for the Chevron Orlando site is presented in Appendix D. If soil samples are identified as hazardous wastes the completed form will be transmitted to FDER.

4.1.9 Contractor Procurement

Chevron Chemical Company has selected Chemical Waste Management, Inc. to remove contaminated waste materials from the site, and to transport and dispose of contaminated materials. Chevron retains the option to select another excavation contractor, and to secure other contractors for the site demolition and clearing activities, as well as the dewatering and water treatment activities. Contractors for all activities will be procured during the preconstruction stage. The names and qualifications of selected construction contractors will be submitted to EPA for approval prior to initiation of construction activities.

4.2 EXCAVATION PLAN

The excavation plan was developed based on EPA's removal action goals, with the option to continue excavation to meet risk-based removal goals. The plan incorporates data presented in the Contamination Assessment Report (BCC, 1990) and additional soil sampling and analysis,

Table 4-6. Waste Characterization, Chevron Orlando Site Soil

Flash Point (F):	>200
Specific Gravity:	1.18
pH:	8.0
Total HOC (mg/kg):	3000**

Pesticides:	Total (mg/kg)	TCLP (mg/l)
2,4,5-TP	nd	nd
2,4-D	nd	nd
4,4-DDD	133.3	40
4,4-DDE	nd	nd
4,4-DDT	43	nd
Aldrin	nd	nd
a-BHC	nd	nd
B-BHC	nd	nd
Chlordane	90	nd
Dieldrin	15.4	nd
d-BHC	nd	nd
Endosulfan	nd	nd
Endosulfan II	nd	nd
Endosulfan Sulfate	nd	nd
Endrin	nd	nd
Endrin Aldehyde	nd	nd
g-BHC	13.1	nd
Heptachlor	nd	nd
Heptachlor Epoxide	nd	nd
Methoxychlor	nd	nd
PCBs	nd	nd

Metals:	Total (mg/kg)	TCLP (mg/l)
Arsenic	9.2	nd
Barium	9.4	0.4
Cadmium	nd	0.01
Lead	nd	nd
Mercury	nd	nd
Selenium	nd	nd
Silver	nd	nd

Other Organics:	Total (mg/kg)	TCLP (mg/l)
1,1-Dichloroethylene	nd	nd
1,2-Dichloroethane	nd	nd
1,4-Dichlorobenzene	7.7	nd
2,4-Dinitrotoluene	nd	nd
Benzene	nd	nd
Carbon Tetrachloride	nd	nd
Chlorobenzene	nd	nd
Chlorophenols	nd	nd
Cresol	nd	nd
Hexachlorobenzene	nd	nd
Hexachloroethane	nd	nd
Methylethyl Ketone	nd	nd
m-Cresol	nd	nd
o-Cresol	nd	nd
p-Cresol	nd	nd
Tetrachloroethylene	nd	nd
Trichloroethylene	nd	nd
Vinyl Chloride	nd	nd

** = Major halogen contribution due to chloride interference

Note: Waste characterization analysis is being rerun to confirm results presented

as described in Section 4.1.2. The excavation plan incorporates demolition and site clearing, excavation and disposal of contaminated soils, and stormwater management.

4.2.1 Demolition

The project site will be cleared of all structures and debris as part of the site restoration effort utilizing seven different types of demolition as shown on Figure 4-7, and as further detailed below.

See Figure 4-7

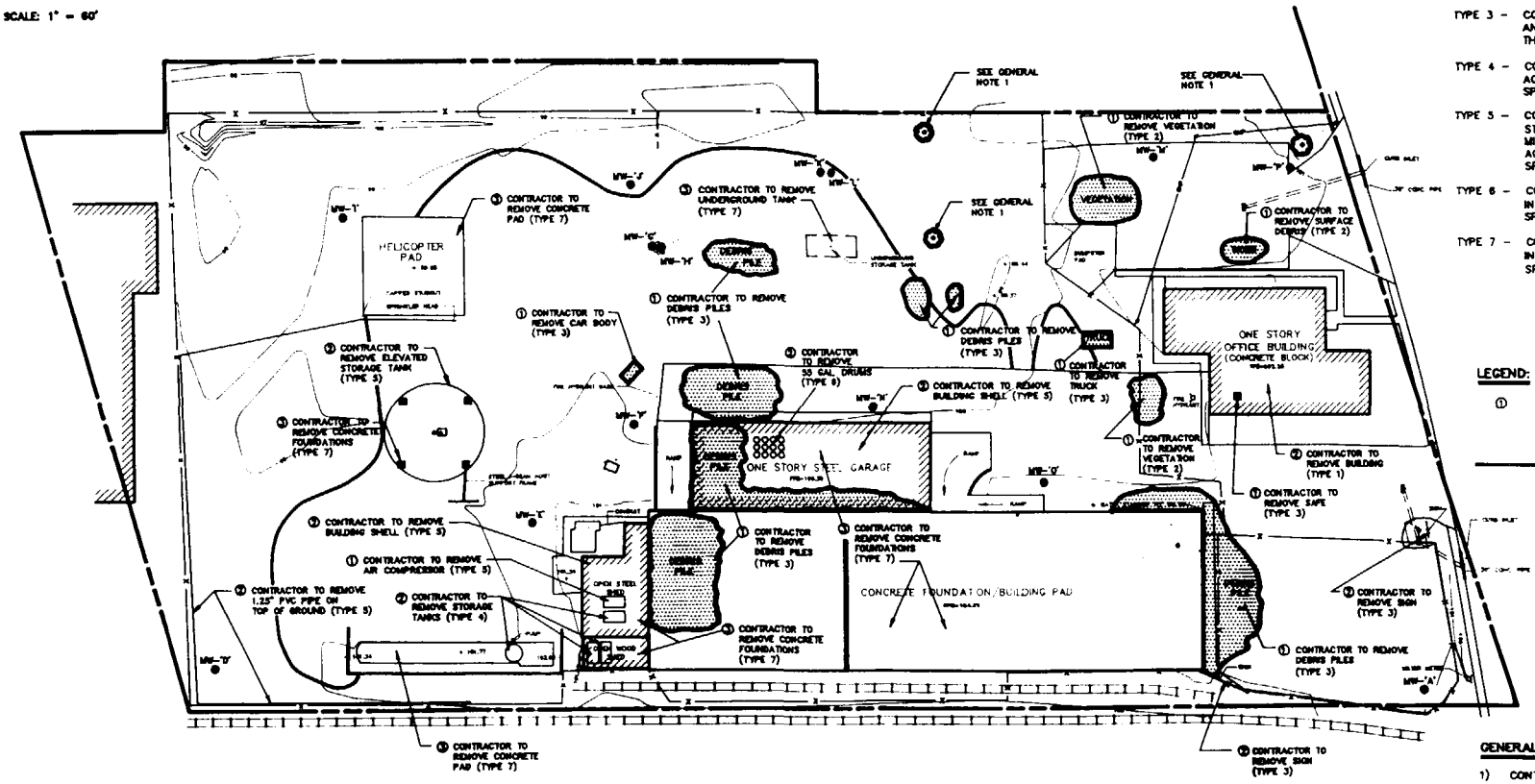
Type 1 demolition will be utilized for the office building located on the eastern portion of the site. An asbestos survey will be performed in accordance with federal and state requirements to determine the presence of asbestos within the structure. If the survey indicates that regulated asbestos is present in the structure, then the asbestos will be removed from the site for disposal at an approved facility. The remaining portions of the building structure will be demolished and removed to an approved construction and demolition debris disposal facility.

Type 2 demolition will be utilized for debris consisting of vegetation and wooden pallet piles. The vegetation and wooden pallets will be removed from the site and disposed of at an approved construction and demolition debris disposal facility.

Type 3 demolition will be utilized for debris piles and surface debris that contains salvageable materials. Salvageable materials, such as steel and aluminum, will be segregated from the debris piles and delivered to an approved reclamation facility. Non-salvageable materials will be classified on-site and removed to an approved landfill facility.

Type 4 demolition will be utilized for the removal of the four above grade storage tanks. Three of the tanks were used for petroleum product storage, and the fourth tank was reportedly used for waste oil storage. The remaining contents of each tank will be sampled and analyzed. Upon successful classification of the contents of each tank, the remaining materials will be emptied into appropriate containers, and transported offsite to an approved disposal or reclamation facility. The tank shells will be decontaminated onsite by steam cleaning, followed by a high pressure water (with surfactant) wash. Decontamination water will be collected for treatment in the onsite water treatment unit (see Section 4.3).

Type 5 demolition will be utilized for the removal of the elevated water storage tank and the remaining above grade building shells. The elevated water storage tank will be dismantled in-place, with the salvageable scrap materials delivered to a reclamation facility. The building shells will also be dismantled in-place with the salvageable scrap metals delivered to a reclamation facility. All materials determined not to be salvageable from Type 5 demolition will be delivered to an approved construction and demolition debris disposal facility.



DEMOLITION NOTES:

TYPE 1 – CONTRACTOR SHALL REMOVE OFFICE BUILDING IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS, TYPE 1 DEMOLITION.

TYPE 2 – CONTRACTOR SHALL REMOVE VEGETATION AND WOODEN PALLETS IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS, TYPE 2 DEMOLITION.

TYPE 3 – CONTRACTOR SHALL REMOVE DEBRIS PILES AND SURFACE DEBRIS IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS, TYPE 3 DEMOLITION.

TYPE 4 – CONTRACTOR TO REMOVE TANKS IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS, TYPE 4 DEMOLITION.

TYPE 5 – CONTRACTOR TO REMOVE ABOVE GRADE STRUCTURES, WATER TANK AND OTHER MISCELLANEOUS DEBRIS ON-SITE IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS, TYPE 5 DEMOLITION.

TYPE 6 – CONTRACTOR TO REMOVE 55-GALLON DRUMS IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS, TYPE 6 DEMOLITION.

TYPE 7 – CONTRACTOR TO REMOVE CONCRETE SLABS IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS, TYPE 7 DEMOLITION.

LEGEND:

① REFERS TO PHASE OF DEMOLITION SEE SPECIFICATIONS

——— EXTENT OF WASTE CONCRETE ON SITE.

GENERAL NOTES:

1) CONTRACTOR TO PROTECT TREES IDENTIFIED FROM DAMAGE DURING THE ENTIRE CONSTRUCTION PROJECT.

2) CONTRACTOR TO PROTECT ALL MONITORING WELLS DURING DEMOLITION – MW '—' ● EXCEPT AS OTHERWISE NOTED.

BUILDING LOCATION, ELEVATIONS, ETC. PROVIDED BY CHEVRON CHEMICAL COMPANY.

Brown and Caldwell Consultants

FILE CHRDEMO.DWG
DRAWN A.O.L.
DESIGNED A.O.L.
CHECKED

LINE IS 2 INCHES AT FULL SIZE
(IF NOT 2"-SCALE ACCORDINGLY)

CHEVRON CHEMICAL COMPANY
CHEVRON SITE – ORLANDO

FIGURE 4-7 DEMOLITION PLAN

DRAWING NUMBER

SHEET

Type 6 demolition will be utilized for the removal of 55-gallon drums temporarily stored on-site. Each 55-gallon drum will be sampled, samples analyzed and classified for disposal. Deteriorating drums will be overpacked for transport. Disposal facilities will be selected based on the nature of the drummed contents. The results of the materials characterization, with the selected disposal facilities, will be submitted to EPA for approval prior to disposal.

Type 7 demolition will be utilized for the removal of concrete pads, building slabs and structures below grade. Material removed by Type 7 demolition in contact with contaminated soils will be decontaminated onsite and transported to a Class I sanitary landfill. Demolition material not in contact with contaminated soils will be disposed of at an approved construction and demolition debris facility.

Demolition will proceed in two stages as follows:

Stage 1: Demolition.. Stage 1 demolition will include the removal of all surface debris (Types 2 and 3), and performance of the necessary sampling, analysis and classification required for Type 1, Type 4 and Type 6 demolition.

Stage 2: Demolition. Stage 2 demolition will include the removal of above grade structures (Types 1 and 5), tanks and drums (Types 4 and 6), and the elevated concrete slab (Type 7). This stage of demolition will enable the contractor to better access the site and will provide sufficient space to construct soil staging areas for the excavation portion of this project.

4.2.2 Excavation

At the completion of Stage 1 demolition, a 6-foot high chain link fence with barbed wire and a visual barricade will be placed along the Orange Blossom Trail right-of-way and partially along the south property line. This fence will have two access gates along Orange Blossom Trail and these accesses will remain locked during the off-construction hours of the project. During the day a guard will be stationed at the gates to prevent unauthorized entry to the site. Within the site, various work zones shall be clearly delineated by traffic control posts and banner tape according to the EPA approved Health and Safety Plan. The Contractor shall provide traffic control as required by the Florida Department of Transportation (FDOT) for equipment and truck access to and from Orange Blossom Trail.

The removal action requires excavation of approximately 3,800 cubic yards of pesticide contaminated soil to achieve the removal action goals. This volume includes:

- 1,050 cubic yards of soil with total chlorinated pesticide concentration ≥ 50 mg/kg to a depth of 1-foot.
- 2,750 cubic yards of soil with total chlorinated pesticide concentrations ≥ 100 mg/kg from 1-foot to the water table.

The distribution of chlorinated pesticides, by depth, is shown on Figures 4-8 through 4-11.

See Figures 4-8 thru 4-12

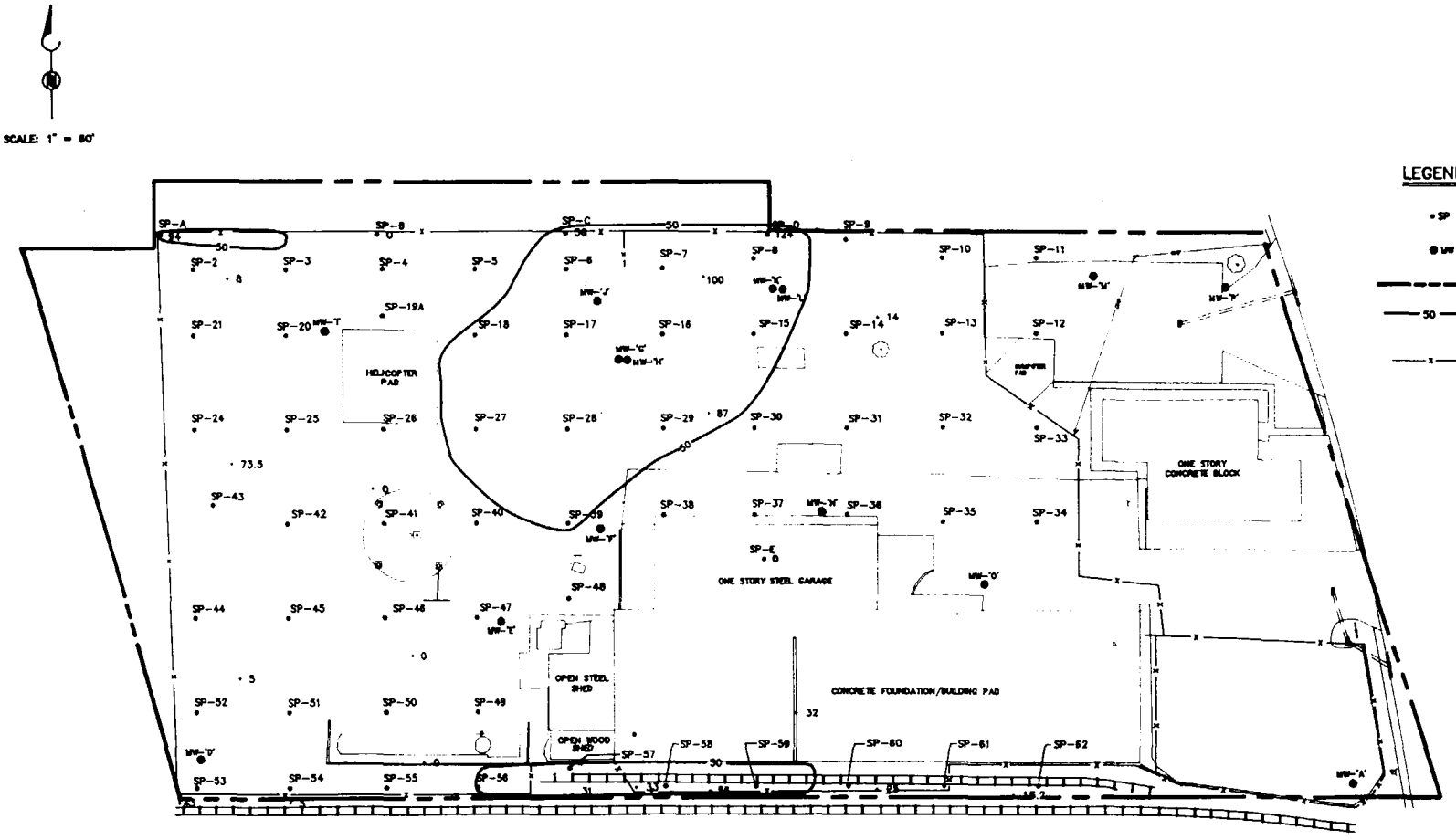
As shown on Figure 4-12, three areas of excavation have been identified. Area I, encompasses the old rinsate lagoons; Area II encompasses a portion of an existing berm located adjacent to and to the north of the northern drainage ditch; and Area III encompasses the railspur.

Prior to initiation of excavation in Area I, a NAPL recovery trench will be constructed to initially remove free product. The trench will be constructed to a depth of approximately 1-foot below the water table, to bisect the areal extent of the NAPL. A sump will be excavated at each end of the trench, and a perforated aluminum culvert pipe installed (vertically). The sump, around the culvert pipe, will be filled with gravel. Product skimmer pumps will be installed in the culverts to skim free product which enters the trench. Soils removed from the trench will be stockpiled, for future disposal, on high density polyethylene (HDPE) and covered with polyethylene sheeting. Recovered product will be drummed and stored temporarily onsite for future disposal. The trench will be constructed following completion of the Stage 2 demolition activities which are to occur in the northern and western portions of the site.

Soils from Area I will be excavated from 0- to 1-foot BLS in the area outlined on Figure 4-8. Confirmation samples will be collected from the side walls, and from the portions of the base of the excavation which are not contaminated with pesticides in excess of 100 mg/kg. The excavation will continue areally until all soils with total chlorinated pesticide concentrations $\geq$ 50 mg/kg are removed. Soils will then be excavated from 1- to 4-feet BLS in the area outlined on Figure 4-9. Confirmation samples will be collected from the sidewalls, and the portions of the base of the excavation which are not contaminated with pesticides in excess of 100 mg/kg. The 1- to 4-foot excavation will also continue areally until soils with total chlorinated pesticides $\geq$ 100 mg/kg are removed.

The remainder of the excavation of Area I will be conducted in sheet-pile cells, to eliminate the need for backsloping, and to facilitate excavation below the water table. Sheet piling will be driven around the perimeter of the portion of the area which will be excavated below 4 feet. This area will be further subdivided into cells, such that each cell can be dewatered by pumping at a rate which is $\leq$ 10 gallons per minute (gpm). Groundwater produced during dewatering will be pumped to an onsite water treatment system (See Section 4.3).

Although the removal action goals require excavation to the water table only, it is anticipated that deeper excavation may be required to achieve the risk-based goals. As observed through the additional soil sampling and analysis (described in Section 4.1.2) high concentrations of chlordane, DDD, and DDT are associated with the NAPL. High concentrations of these chlorinated pesticides were also detected in samples collected from 8 to 10 feet BLS. Field data suggest that the 8- to 10-foot interval is part of the "smear zone", i.e., the vertical extent of the soil column covered by the seasonal fluctuation of the water table. As the water table fluctuates,



NOTE:
CONCENTRATION CONTOUR INTERPOLATED FROM 2-4 FOOT SAMPLE ANALYTICAL RESULTS, CONTAMINATION ASSESSMENT ANALYTICAL RESULTS, AND ANALYTICAL RESULTS FOR SAMPLES A, B, C, AND D.

BUILDING LOCATION, ELEVATIONS, ETC. PROVIDED BY CHEVRON CHEMICAL COMPANY.

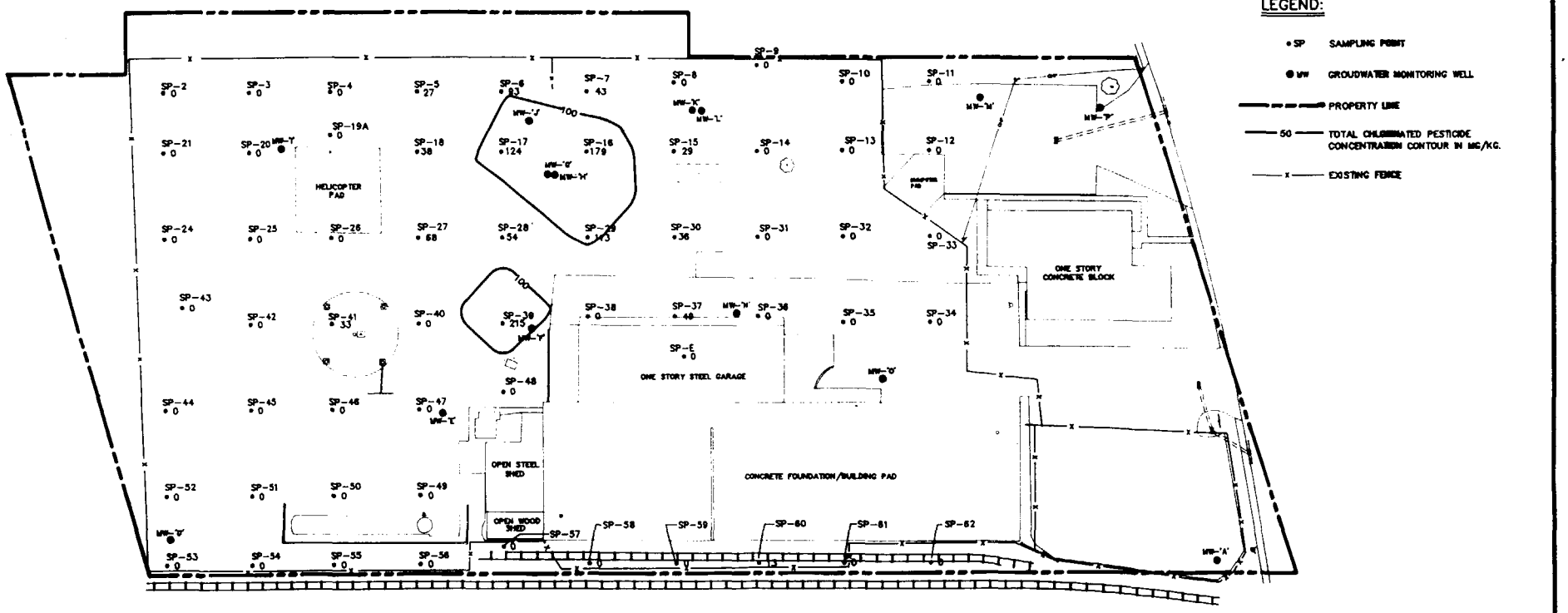
Brown and Caldwell Consultants

FILE CHRO-1.DWG
DRAWN A.O.L.
DESIGNED A.O.L.
CHECKED

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

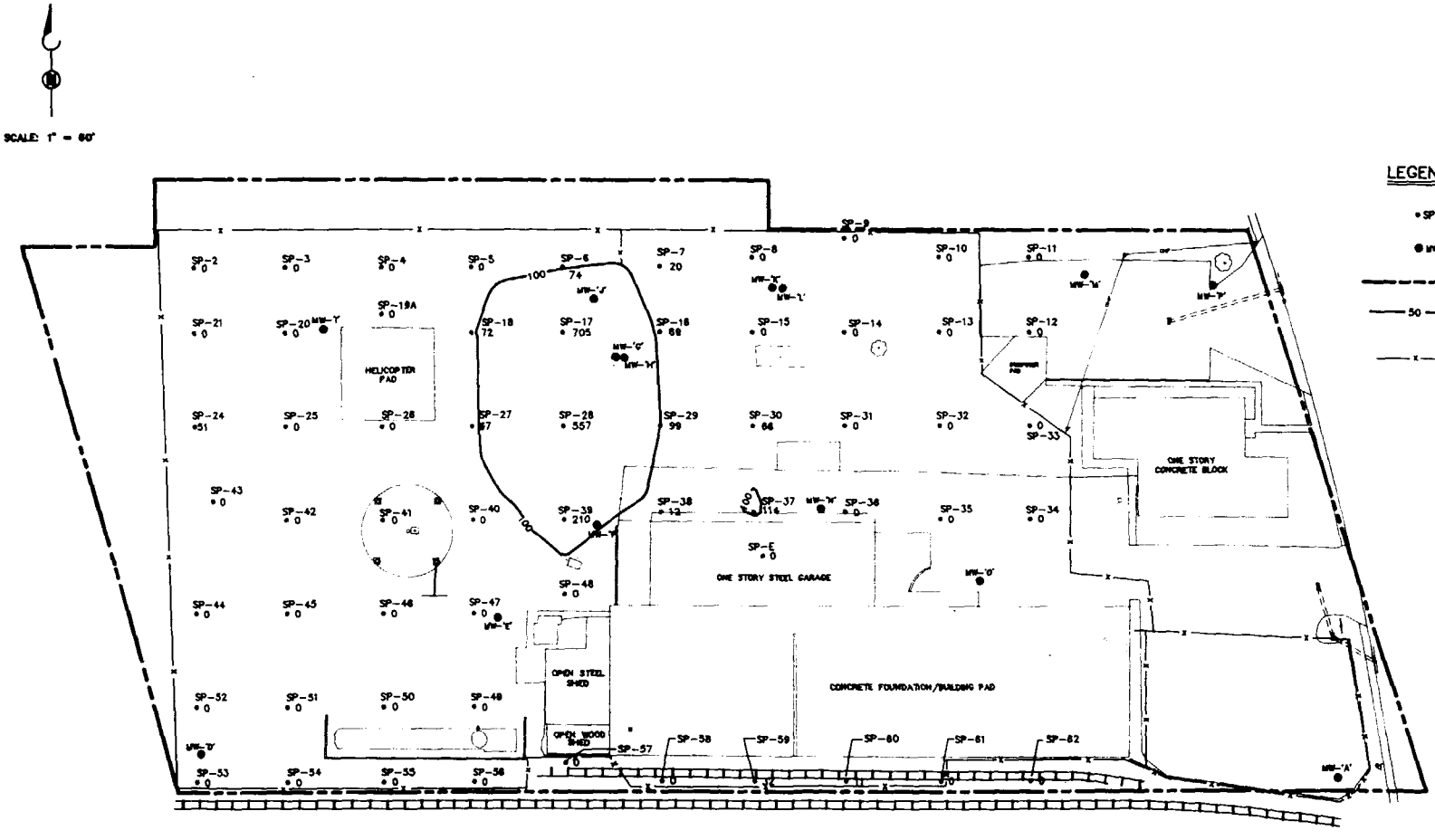
CHEVRON CHEMICAL COMPANY
CHEVRON SITE – ORLANDO

FIGURE 4-8
TOTAL CHLORINATED PESTICIDE CONCENTRATIONS AT DEPTH 0-1 FEET



BUILDING LOCATION, ELEVATIONS, ETC. PREPARED BY CHEVRON CHEMICAL COMPANY.

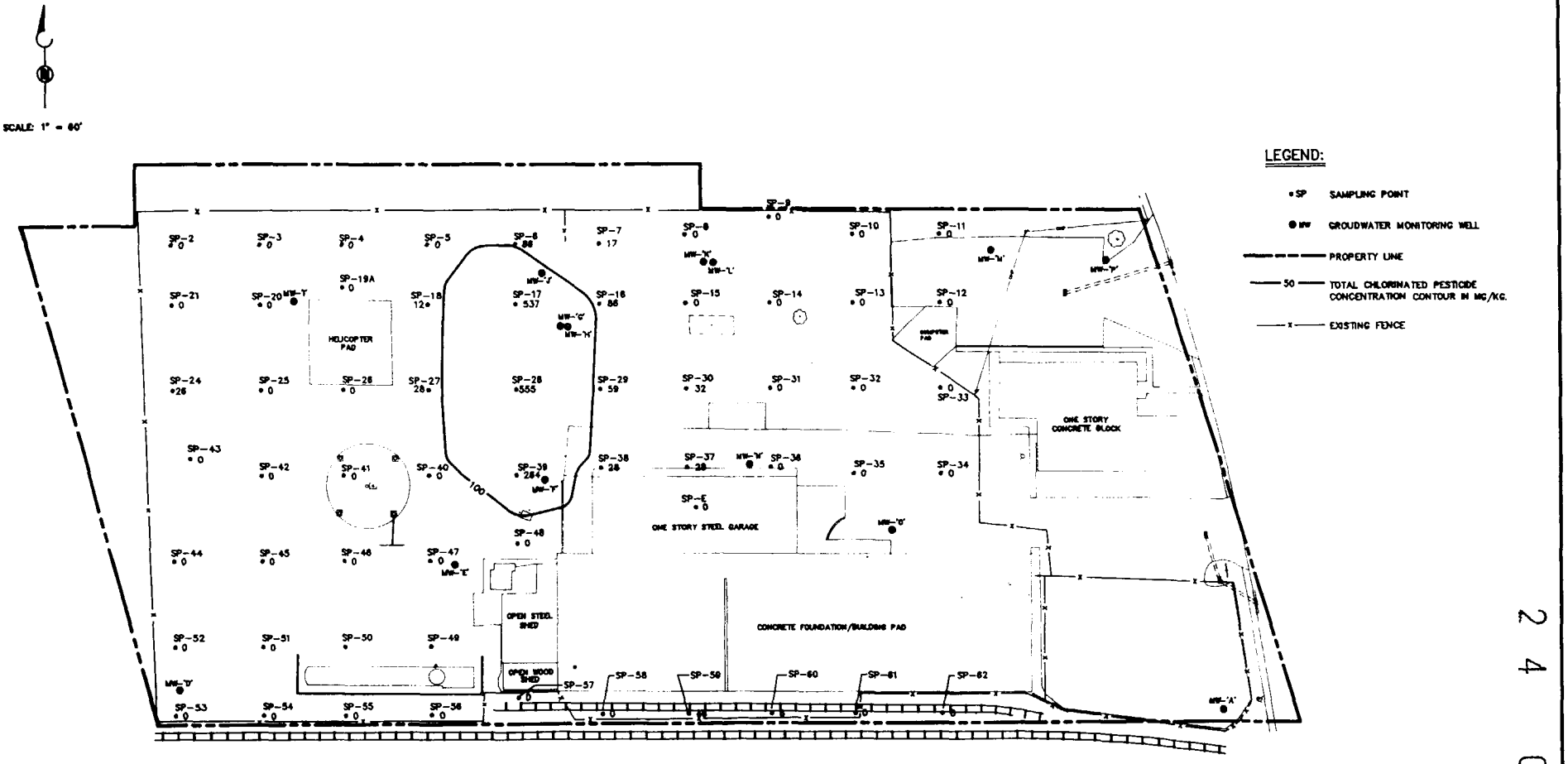
Brown and Caldwell Consultants	FILE CHR1-4.DWG DRAWN A.O.L. DESIGNED A.O.L. CHECKED	LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)	CHEVRON CHEMICAL COMPANY CHEVRON SITE – ORLANDO	FIGURE 4-9 TOTAL CHLORINATED PESTICIDE CONCENTRATIONS AT DEPTH 1-4 FEET



2 4 0051

BUILDING LOCATION, ELEVATIONS, ETC. PROVIDED BY CHEVRON CHEMICAL COMPANY.

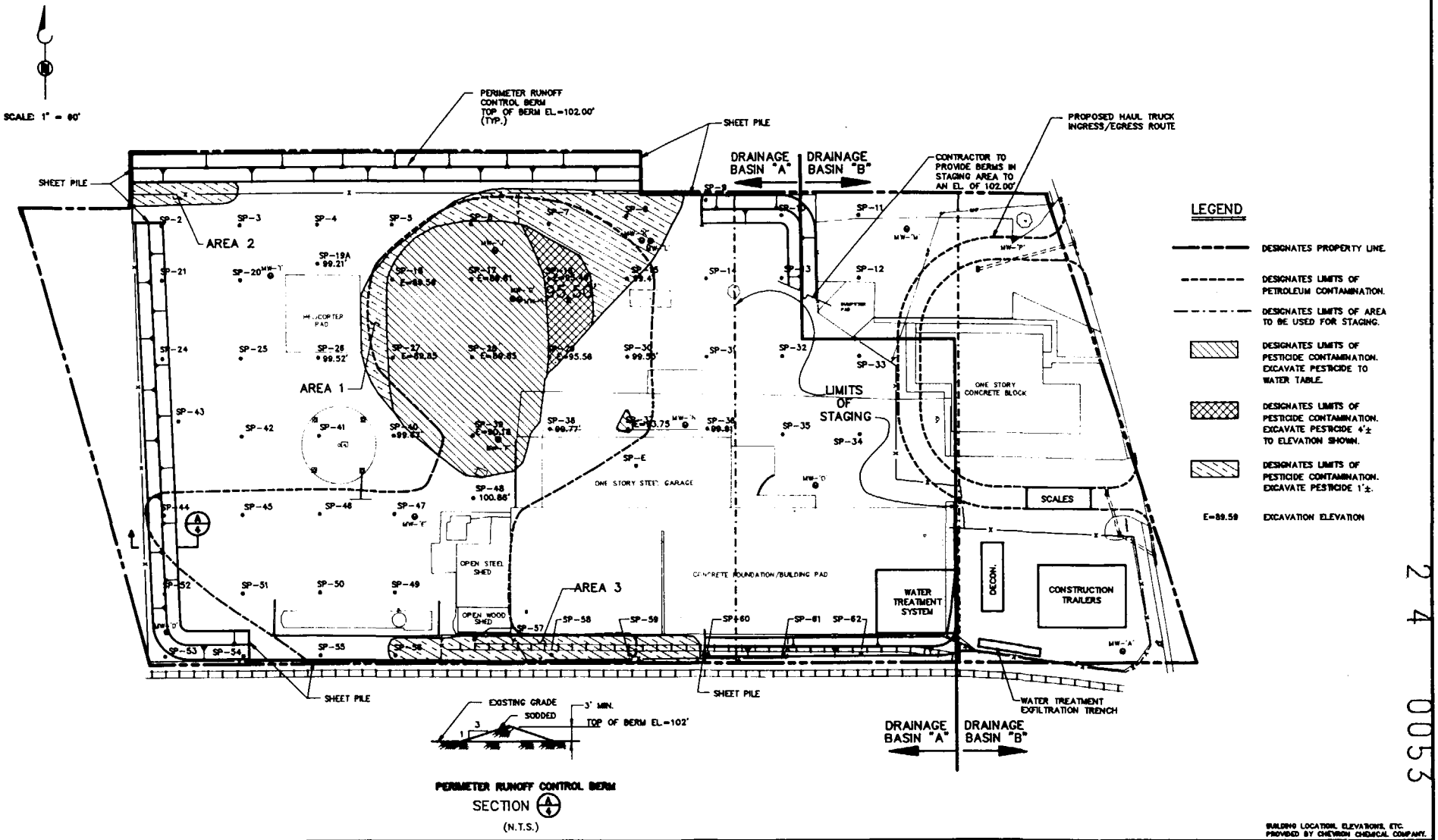
Brown and Caldwell Consultants	FILE CHR4-6.DWG DRAWN A.O.L. DESIGNED A.O.L. CHECKED	LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)	CHEVRON CHEMICAL COMPANY CHEVRON SITE – ORLANDO	FIGURE 4-10 TOTAL CHLORINATED PESTICIDE CONCENTRATIONS AT DEPTH 4-6 FEET



2 4 0052

BUILDING LOCATION, ELEVATIONS, ETC. PROVIDED BY CHEVRON CHEMICAL COMPANY.

Brown and Caldwell Consultants	FILE CHRS-8.DWG DRAWN A.O.L. DESIGNED A.O.L. CHECKED	LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)	CHEVRON CHEMICAL COMPANY CHEVRON SITE – ORLANDO	FIGURE 4-11 TOTAL CHLORINATED PESTICIDE CONCENTRATIONS AT DEPTH 6-8 FEET



2 4 0053

Brown and Caldwell Consultants	FILE CHRSTORM.DWG DRAWN A.O.L. DESIGNED A.O.L. CHECKED	LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)	CHEVRON CHEMICAL COMPANY CHEVRON SITE – ORLANDO	FIGURE 4-12 STORMWATER, EXCAVATION AND STAGING PLAN

the NAPL is trapped in the void spaces between soil particles and remains in place as the water table rises. This zone may represent a continuing source of contamination which is ultimately transported to the groundwater. the final depth of excavation (to a maximum of 10 feet will be Figure 4-12 determined based on the results of the risk assessment. The distribution of total chlorinated pesticides in the 8- to 10-foot zone is presented on Figure 4-13.

See Figure 4-13

Areas II and III will be excavated to a depth of 1-foot to remove soils with pesticide concentrations ≥ 50 mg/kg. Area II, which encompasses a portion of the berm along the northern fence line, will be excavated prior to construction of the perimeter berm shown on Figure 4-12. For excavation of Area III, sheet piling will be driven along the southern boundary of the area to maintain the structural stability of the adjacent active railroad track. Additional surface soil samples will be collected in transects across the rail spur and analyzed in the onsite laboratory to more accurately delineate the area of excavation, prior to installation of the sheet piling.

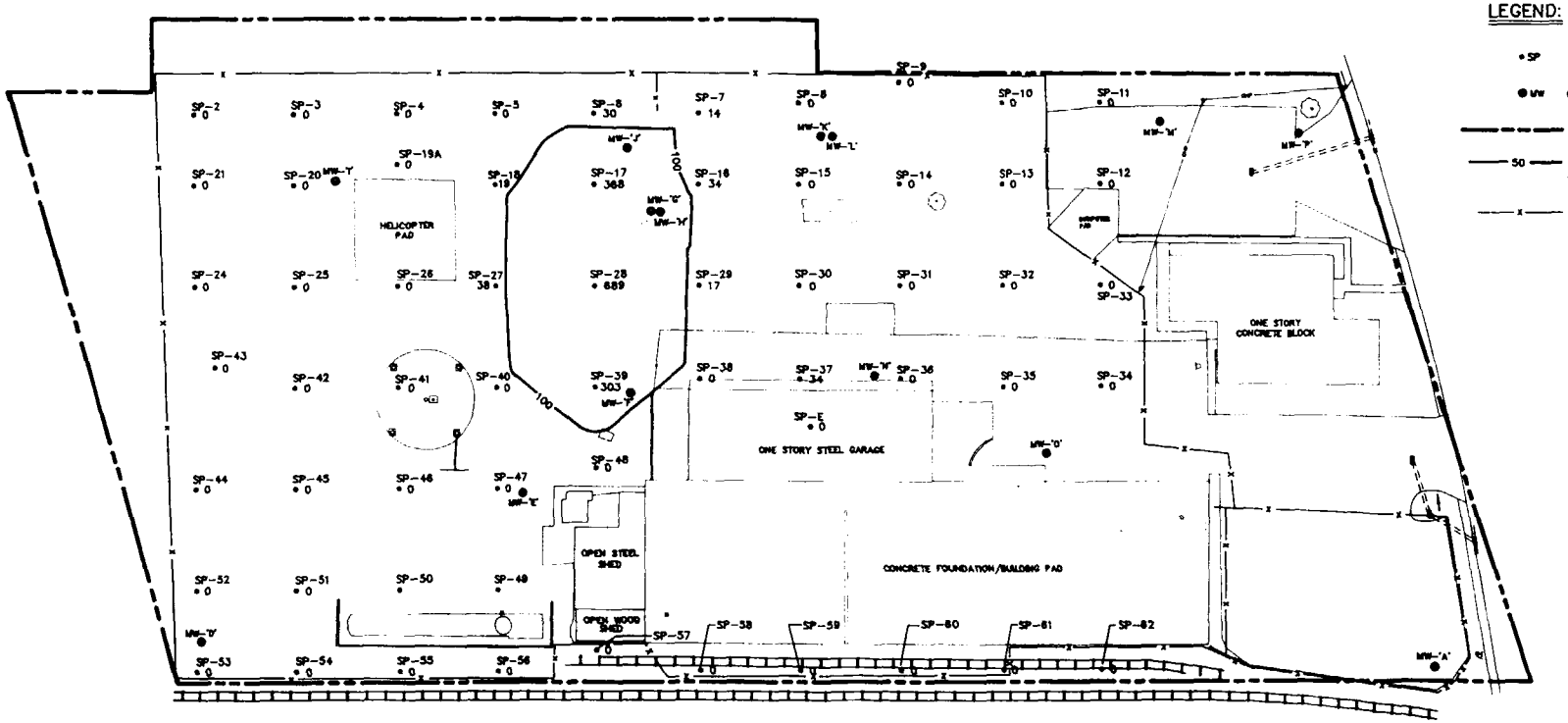
As excavation in all areas progresses, confirmation samples will be collected and analyzed as described in Section 4.5 to ensure that goals are met. As described in Section 4.4, Chevron Chemical Company may utilize a proprietary onsite treatment method to treat soils with contaminant concentrations which exceed the risk-based goals but are below the removal action goals. If the soil treatment option is not selected, soils in Areas I, II, and III will be excavated to achieve risk-based goals, and transported offsite for disposal.

The excavation plan (Figure 4-12) also denotes an area of petroleum contamination in the soils. This area was identified using field screening procedures, and limited quantitative data are available. This area will be sampled and the samples analyzed utilizing the mobile laboratory. Risk-based remedial goals for petroleum contamination will be identified through the risk assessment process. Soils contaminated with petroleum products will be excavated and transported offsite for disposal. A local, state-approved disposal facility will be selected based on the chemical characteristics of the petroleum contamination.

Soils will be excavated and removed to the soil staging area shown on Figure 4-12, for loading, transport, and disposal offsite. Excavation will be limited to 400 cubic yards per day. A composite soil sample will be collected and analyzed from each 400 cubic yard stockpile to verify that total halogenated organic compound (HOC) concentrations are below 1000 mg/kg. Any soils which exceed 1000 mg/kg HOCs will be stockpiled for transport to a hazardous waste incinerator.

4.2.3 Sheeting, Shoring, and Bracing

Excavation work to a depth of 4 feet will be performed utilizing sloping of the sideslopes in accordance with the standards set forth by the Occupational Safety and Health Administration (OSHA) and the State of Florida (Florida Trench Safety Act). Excavation below 4-foot level will Figure 4-13 be accomplished with sheet piling. Additional sheeting, shoring, and/or bracing may be required adjacent to buildings or property lines where sidesloping setbacks are not possible.



2 4 0055

BUILDING LOCATION, ELEVATIONS, ETC. PROVIDED BY CHEVRON CHEMICAL COMPANY.

Brown and Caldwell Consultants	FILE CHR8-10.DWG DRAWN A.O.L. DESIGNED A.O.L. CHECKED	LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)	CHEVRON CHEMICAL COMPANY CHEVRON SITE – ORLANDO	FIGURE 4-13 TOTAL CHLORINATED PESTICIDE CONCENTRATIONS AT DEPTH 8-10 FEET

The excavation contractor will be responsible for all sheeting, shoring, and/or bracing in accordance with applicable federal and state regulations.

4.2.4 Dust Control

The Contractor will conduct all soil excavation, loading and transfer in such a manner as to minimize dust generation. Paved or grassed areas will be used wherever possible for onsite equipment and vehicle movement. Dust abatement measures may include covering stockpiled soils or open excavations with polyethylene sheeting or applying temporary foam coatings. The dust nuisances may also be abated by sprinkling site areas with water. Paved areas may be swept and/or rinsed with water and unpaved areas traversed by onsite vehicle traffic may be sprinkled as needed with water. The use of water will not result in offsite discharge or excessive on-site accumulation, particularly in soils stockpiled for offsite disposal.

In addition to dust generation control, actions will be taken to restrict the offsite release of dust which is generated. Fence screening will be installed on the north and east site-boundary fencing. In addition, a 1-inch diameter water line with sprinkler heads attached, spaced to provide continuous coverage, will be installed along the northern property boundary. This sprinkler system will be operated on an as-needed basis. Hose bibs will be located along this water line to allow for the attachment and use of portable sprinkler units at work areas within the site boundaries.

4.2.5 Soil Staging and Loading

Contaminated soils will be excavated using a track-mounted hydraulic excavator. The soils will be staged at accessible loading areas on the edge of the excavation, and moved to the soil staging cells with a front end loader or equivalent.

The soil staging area is to be constructed on the east central portion of the site as shown on Figure 4-12. The contractor will be responsible for establishing soil staging areas with capacity to segregate two 400-cubic yard stockpiles, a stockpile for soils with HOCs in excess of 1000 mg/kg, and petroleum (only) contaminated soils.

Once confirmatory analyses are concluded (as described in Section 4.5), the soils will be removed from the staging area by a rubber-tire loader or track hoe and placed into 20-cubic yard trucks for offsite transport. The empty staging areas will be decontaminated as necessary prior to the initiation of the next day's excavation.

Once a truck is loaded, it shall be securely covered and the vehicle and its contents weighed. Manifest documents, which have been appropriately completed based on the confirmatory sampling/analysis and weigh data, will then be transferred to the transporter of each waste load.

4.2.6 Offsite Disposal, Manifesting and Notification

All hazardous waste offered for transport from the Chevron Orlando site to off-site treatment or disposal facilities must be accompanied by a completed Uniform Hazardous Waste Manifest (EPA form 8700-22). A copy of this manifest is provided in Appendix F.

The generator, or generator's agent will designate the intended disposal facility which is permitted to handle the waste on the manifest and may designate an alternate facility should the primary facility be unavailable. Chemical Waste Management, Inc, (CWM) facilities will be used for offsite pesticide waste disposal. The landfill which will be used for contaminated soil disposal is identified as follows:

Chemical Waste Management, Inc.
Hwy. 17 North, Mile Marker 163
Emelle, Alabama 35459
Phone: (205) 652-9721
USEPA ID: ALD 000622464

If any waste material requires incineration in a facility permitted to manage hazardous waste, the designated facilities are:

Trade Waste Incineration	CWM Chemical Services, Inc.	Chemical Waste Management
#7 Mobile Avenue	11700 S. Stoney Island Avenue	Hwy 73
Sauget, IL 62201	Chicago, IL 60617	Port Arthur, TX 71640
(618) 271-2804	(312) 646-5700	(409) 736-2821
EPA ID#: ILD 066918327	EPA ID#: ILD 000672121	EPA ID#: TXD 000838896
Technical Manager: James Gary	Technical Manager: Kurt Frey	Permit: HW 50211-001

Prior to shipping a hazardous waste off-site the generator must complete Items 1 through 15 on the appropriate manifest form depending on material and disposer location. (Completion of Items A through K are not required by federal law). The generator must then sign and date the manifest certification (Item 16) and obtain the signature and date of acceptance by the initial transporter. The generator will retain one copy of the manifest and give all remaining copies to the transporter. The designated management facility will return a completed copy to the generator. Copies of all completed manifests will be provided to the State of Florida.

In addition to a manifest, each shipment of waste subject to a nationwide variance under Subpart C 268.7 (a)(3) must be accompanied by a notification for the land disposal facility receiving the waste. This notification must contain the following information:

- EPA hazardous waste code(s),
- Corresponding concentration-based or technology-based treatment standards, or all applicable prohibitions,

- Manifest number,
- Waste analysis data, where available,
- The date the waste is subject to the prohibitions, and
- A statement that waste is not prohibited from land disposal.

4.2.7 Stormwater Management

The site is generally level, with stormwater runoff drainage patterns as indicated in Figure 4-1. Based on field inspection and existing topographical information, there does not appear to be a potential for offsite stormwater runoff to flow across the subject property. Runoff patterns indicate that approximately 1-acre, along the east property boundary, drains into existing storm drains which are connected to the existing Orange County stormwater system along Orange Blossom Trail. An area of approximately one-quarter-acre, located in the southwest corner of the site, may produce surface flow offsite, along the existing rail right-of-way. An existing ditch located along the north fence line collects a large portion the runoff and transports it to a low lying area in the northwest corner of the subject property.

A 3-foot high runoff control berm will be constructed around the perimeter of the soil excavation work zone prior to excavation of contaminated soil (with the exception of Area II). The approximate limits of the perimeter runoff control berms are indicated on the Stormwater, Excavation and Staging Plan (see Figure 4-12). The berms will effectively divide the site into two drainage basins which are designated A and B. Basin A consists of the excavation work zone and is designed to detain the runoff from a 100-year, 72-hour storm event within the confines of the perimeter berms. The existing drainage features in Basin B will not be modified. These features allow stormwater runoff to discharge to the Orange County stormwater collection system along Orange Blossom Trail. Basin storage calculations and stormwater runoff quantities are included in Appendix F. The perimeter runoff control berms will be left in place after completion of the removal action.

4.2.8 Dewatering

The excavation required to achieve risk-based goals may intersect the groundwater table. To enable construction equipment to operate efficiently at this depth, the excavation will be dewatered. A flow net analysis (Appendix G) was performed to determine the rate of pumping required to adequately dewater the excavation. Based on the flow net analysis, sheet-pile cells will be constructed with maximum dimensions of 50 feet by 60 feet, to produce no more than 10 gpm of groundwater per cell.

4.3 GROUNDWATER TREATMENT/DISPOSAL

During the soil removal operations, potentially contaminated water flows will result from soil dewatering, equipment decontamination and personal hygiene (washup). Maximum flow from these operations is estimated at 10 gallons per minute (gpm) or approximately 14,400

gallons per day (gpd). Flow equalization will be provided in the treatment process for peak flows from rainfall events. Disposal of treated water will be to an onsite exfiltration trench.

Groundwater quality data and treatment goals are summarized in Table 4-7. Due to the highly localized nature of the planned dewatering operation, normal attenuation of contaminant concentrations during active pumping has not been assumed for treatment design purposes. It should be noted that skimmer pumps will be utilized to remove free product in the dewatering trenches. This action will lower observed contaminant concentration peaks. Examination of the data show the following major treatment concerns:

See Table 4-7

- Removal of the inorganic contaminants arsenic and chromium.
- Removal of volatile organic compounds such as benzene.
- Removal of synthetic organic compounds such as lindane.
- Reduction of natural inorganic groundwater constituents such as iron, to facilitate treatment.

Figure 4-14 provides a schematic for the water treatment system. The planned treatment system will be a packaged, skid-mounted (as appropriate) unit to be temporarily located onsite. The major unit processes are as follows:

See Figure 4-14

- Oil/Water Separator: A 2000-gallon unit will be provided for separation of free product, coalescing of oil droplets, and equalization of flow and contaminant concentrations.
- Coagulation/Filtration: A 10 gpm flow capacity package plant will be provided for coagulation/coprecipitation of arsenic and chromium, reduction of dissolved and suspended solids and removal of iron.
- Air Stripping Tower: An 8-inch diameter air stripping tower will be utilized to strip and remove volatile and semivolatile organic chemicals.
- Granular Activated Carbon (GAC): A GAC absorption system with a 60-minute contact time will provide primary removal of synthetic organic chemicals and polishing for volatile organic chemical removal.
- Effluent Storage: A 10,000-gallon effluent storage tank will provide suitable detention time for water quality analysis and storage during rainfall periods.

Table 4-7

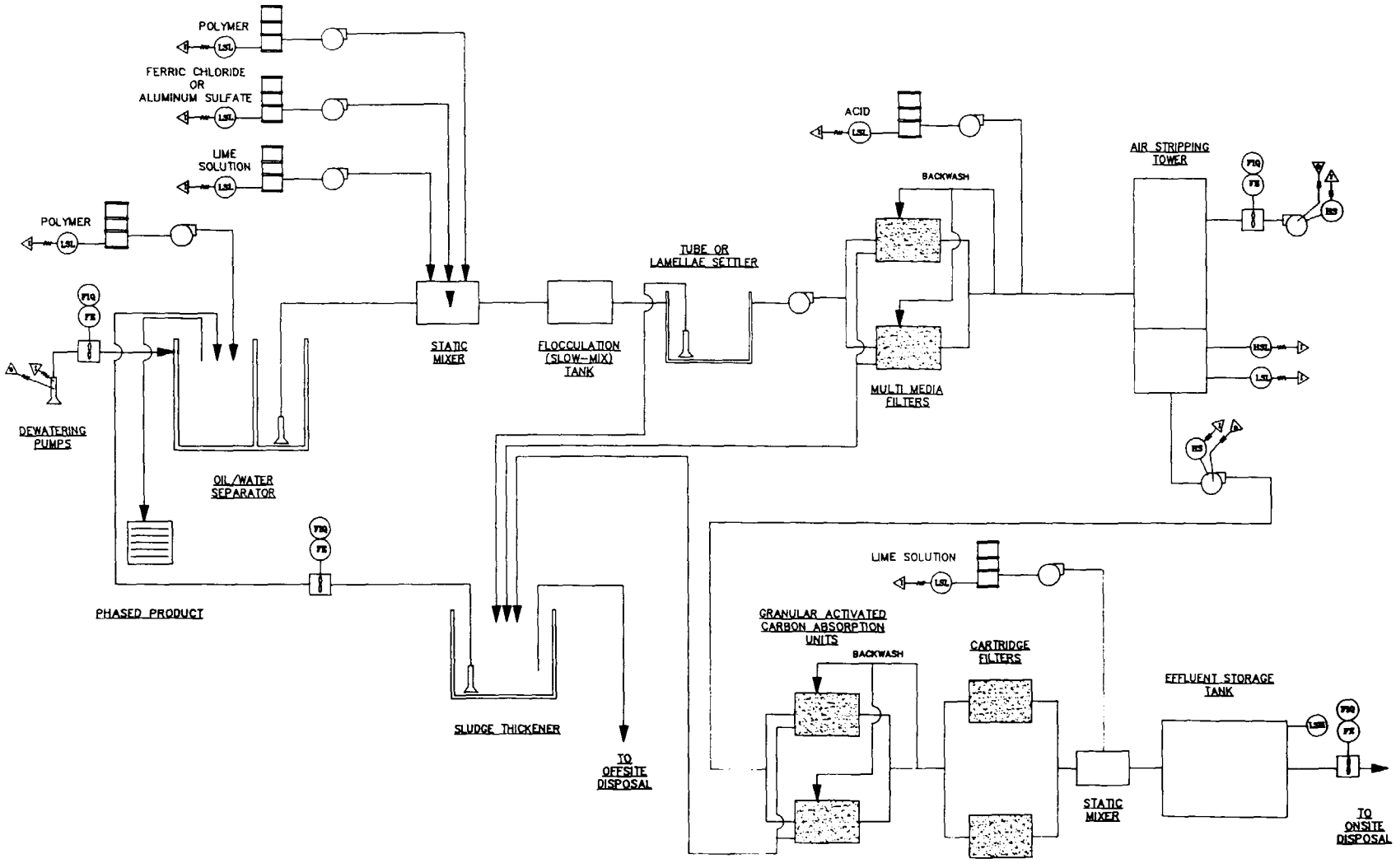
WATER QUALITY AND DATA TREATMENT GOAL

Contaminant	Maximum Observed Concentrations (in mg/l)	Treatment Goals (in mg/l)
Arsenic	0.03	0.05[1]
Benzene	0.097	0.005[1]
Lindane	0.0017	0.0002[1]
Chlorobenzene	0.130	0.1[1]
Chromium	0.031	0.1[1]
1,1-Dichloroethylene	0.120	0.007[1]
Endrin	0.001	0.002[2]
Ethylbenzene	0.220	0.7[1]
Heptachlor	0.00026	0.0004[1]
Methylene Chloride	0.290	0.005[2]
Toluene	0.088	1[1]
1,1,2-Trichloroethane	0.220	0.005[2]
Xylenes	1.300	10[1]
Zinc	0.04	50[3]
1,2-Dichlorethane	0.056	0.005[1]
1,4-Dichlorobenzene	0.150	0.6[1]

[1] = National Primary Drinking Water Regulation - Final Rule (58FR 3528, January 1991)

[2] = National Primary Drinking Water Regulation - Proposed Rule (55FR 30371, July 1990)

[3] = National Secondary Drinking Water Regulation (58FR 3528, January 1991)



Brown and Caldwell Consultants

FILE PID.DWG
DRAWN M.C.D.
DESIGNED D.L.T.
CHECKED M.P.S.

LINE IS 2 INCHES AT FULL SIZE
(IF NOT 2"-SCALE ACCORDINGLY)

CHEVRON CHEMICAL COMPANY

CHEVRON SITE – ORLANDO

FIGURE 4-14
PROCESS AND INSTRUMENTATION DIAGRAM

2 4 0061

- Sludge Handling: A 5,000-gallon sludge storage/thickening tank will be provided for the thickening and storage of sludges from the coagulation process, backwash water from the multimedia and GAC filters, and miscellaneous chemical and cleaning solutions.

Offsite impacts of the water treatment system operation will be minor. Field analysis of the monitor wells onsite did not detect any hydrogen sulfide, thus precluding a possible odor source. Contaminant emissions arising from the air stripping process will result in ambient concentrations substantially below state guidelines given the low emission rate (estimated at 0.04 lbs/hours). Waste sludge and spent GAC will be transported offsite to a hazardous waste management facility or (for GAC) regeneration facilities.

4.4 SOIL TREATMENT TESTING

Bench scale testing is currently underway for a proprietary treatment process that could result in a potential cost reduction for the site removal action. Preliminary tests of the process conducted at the University of Cincinnati, Cincinnati, Ohio, and Brown and Caldwell Analytical Laboratories in Ervine, California, have shown favorable results. However, further bench scale testing is required to enable optimization of the treatment process.

Process testing will continue with the intention that it may provide a viable onsite treatment option; however, it is understood that this process development may not meet the time limitations required for the removal action at the Chevron Orlando site. If further bench-scale testing results indicate that the treatment technology is viable for use onsite within the removal action schedule, the results and pilot-test plan will be submitted to EPA for review and approval.

4.5 CONFIRMATORY SAMPLING AND ANALYSIS

Soil sampling and analysis will be conducted throughout the duration of the removal action to determine the extent of excavation, and effectiveness of the source removal action. Confirmation samples will be collected and analyzed (utilizing CLP protocol) at the completion of all excavation activities, and prior to backfilling, to demonstrate that risk-based removal goals have been achieved.

Samples will also be collected of the onsite water treatment system effluent. Samples will be collected daily and analyzed by the mobile laboratory prior to effluent discharge. An effluent sample will also be collected weekly and analyzed in the offsite laboratory for the contaminants of concern, to verify the treatment system efficiency.

4.5.1 Excavation Sampling

During the removal action, soil sampling will be conducted on a daily basis to determine the final area and volume of soil to be excavated and removed. Initially, the soil area determined to be in excess of removal action goals will be excavated and stockpiled. At the end of each day

of excavation, the stockpiled soil will be sampled by compositing several samples taken from random points in the stockpile and analyzed for total organochlorine pesticides using a mobile laboratory equipped with a gas chromatograph. The results of this analysis will be used to verify that the soils can be land disposed.

Following excavation of the predetermined area from the 0- to 1-foot depth interval (Figure 4-8), soil samples will be collected at 20-foot intervals about the perimeter of the excavation and vertically composited. The samples will be analyzed by the on-site laboratory for total organochlorine pesticides. The resulting data will be used to determine the need for further lateral excavation. These steps will be repeated for each specified excavation depth interval.

A final sampling effort will be conducted when the limits of excavation have been determined by the field analytical methods. Soil samples from the areas of pesticide contamination will be collected in the same manner described above, but will be shipped off-site for laboratory analysis of organochlorine pesticides, organophosphate pesticides, volatile and semivolatile organic compounds, chromium and arsenic. The resulting data will be used to confirm the effectiveness of source removal.

Sampling, similar to that described above, will be conducted during excavation of petroleum contaminated soils. These soils will be analyzed by the mobile laboratory using EPA Method 602. Confirmation samples will be analyzed offsite for the kerosene group analytical parameters as defined in Florida Administrative Code, Chapter 17-770.

4.5.2 Treatment Process Sampling

Should the onsite soil treatment process presented in Section 4.4 prove to be effective and the process employed at the Chevron Orlando site, sampling will be conducted to evaluate the treatment effectiveness prior to the return of the soil as backfill to the excavation. Composite samples will be collected from either each treatment batch or, if the final process design is as a continuous feed system, at time intervals that will be determined by the feed rate. These samples will be analyzed onsite to determine if treatment is complete. Five percent of the samples will be split and analyzed at an off-site laboratory for the full suite of contaminants of concern as a check of analytical representativeness. Treated soil will be stockpiled until analytical results are returned. If treatment has not reduced contaminant levels below the minimum required, the soil batch will either be reprocessed, or disposed of offsite.

Effluent samples from the dewatering water treatment system will be collected and analyzed to verify treatment system efficiency prior to effluent discharge. During the first week of the water treatment system operation, samples will be collected daily for analysis by the onsite laboratory, with duplicate samples set to the offsite laboratory. The duplicate samples will be analyzed for organochlorine pesticides, organophosphate pesticides, volatile organic compounds, arsenic and chromium. Daily samples will be collected throughout the treatment process for

analysis by the mobile laboratory to verify effluent concentrations prior to discharge. Samples will be collected at the end of each work week for analysis offsite for the parameters described above.

4.6 SITE RESTORATION

At the completion of all excavation activities, and onsite treatment (if utilized), the site will be backfilled with imported, clean native fill and compacted to return the site to original grade. Final grading for the project will provide a generally flat slope to the property. The perimeter runoff control berms constructed at the beginning of the removal action shall remain. Along the east property line, the existing grades shall remain and the stormwater runoff shall continue to drain to the Orange County stormwater collection system along Orange Blossom Trail (Highway 441). Unpaved portions of the site will be seeded and maintained to minimize erosion and dust generation.

4.7 DESIGN AND INSTALLATION OF GROUNDWATER RECOVERY AND TREATMENT SYSTEM

The groundwater quality at the site may require recovery and treatment for the removal of pesticides, semi-volatile and volatile organic compounds and possibly metals. The design of the groundwater recovery and treatment system will be based on additional groundwater characterization data, including that obtained during the groundwater investigation described in Section 4.1.5

Upon completion of the groundwater investigation, which will include sampling and analysis of existing onsite groundwater monitor wells, the full extent of the groundwater plume(s) will be delineated. Based on the plume configuration and aquifer characteristics, groundwater modeling will be performed to design the groundwater extraction system to ensure complete capture of the contaminated plume(s).

The process design for the groundwater treatment system will be based on the additional groundwater characterization data and will be similar to that described in Section 4.3. Specifically, the treatment system will consist of gravity oil/water separation; chemical addition, flocculation and sedimentation for removal of chromium and iron; filtration; air stripping for removal of volatile organic compounds; activated carbon adsorption for removal of pesticides and semi-volatile compounds; and post filtration.

The treated effluent will be discharged to an onsite percolation/evaporation pond for disposal. The groundwater modeling to be performed to design the groundwater extraction system will incorporate the evaporation/percolation pond, and the results of the modeling will provide design criteria for the pond.

Once the design of the groundwater recovery and treatment system is completed, the construction drawings and specifications will be prepared and submitted to EPA for review and approval. The groundwater recovery and treatment system will be operated and maintained until groundwater contaminant concentrations have reached applicable removal goals.

CHAPTER 5.0

REMOVAL GOAL VERIFICATION PLAN

Removal goal verification will be initiated following completion of all site removal activities. The Removal Goal Verification Plan will summarize the removal activities and will address groundwater monitoring, site maintenance, and description of future land use(s).

The description of removal activities will address quantities of soils excavated and (optionally) quantities of soils treated and replaced onsite. Drawings will be provided which delineate limits (horizontal and vertical) of soils excavation and limits of treated soil placement, and show final site elevations. Confirmation sample analytical results will also be presented.

The groundwater monitoring element of the plan will describe groundwater characteristics at the termination of the removal action, wells to be monitored, the frequency and duration of sampling, the parameters to be sampled and analyzed for, and reporting requirements. The plan will utilize a minimum of three monitoring wells, one downgradient of the contaminant plume prior to remediation, one in the area of highest contaminant concentration, and one upgradient of the pre-remediation contaminant plume.

The site will be inspected concurrent with groundwater monitoring to ensure that site surface conditions have not degraded. The final soil and vegetative cover will be maintained. Any settling, subsidence or erosion which affects site contouring will be corrected.

At the conclusion of the goal verification monitoring period, the responsible party(ies) will submit to EPA Region IV a certification that objectively verifies that the post-closure maintenance and monitoring have been conducted in accordance with the approved plan.

CHAPTER 6.0

PROJECT MANAGEMENT PLAN

The purpose of the project management plan (PMP) is to identify the various entities involved in the removal action at the site, and to describe the responsibilities and reporting relationship of each entity. Figure 6-1 presents the project organization chart. As shown, Chevron Chemical Company is controlling the removal action, with EPA Region IV oversight in accordance with the Administrative Order on Consent. Chevron has contracted Brown and Caldwell, as their agent, to provide engineering support and construction management to ensure that the removal action is performed in accordance with the RAP. As Chevron's agent, Brown and Caldwell will be responsible for overseeing all of the removal action activities to be performed by Chemical Waste Management, the general contractor. As general contractor, Chemical Waste Management will be responsible for the excavation, hauling, disposal, and site restoration activities included in the RAP. Additional contractors may be selected for demolition and dewatering/treatment.

See Figure 6-1

To support Brown and Caldwell in management of the construction and in the performance of the additional groundwater investigation, the subcontractors shown on Figure 6-1 will provide laboratory support, drilling and monitor well installation, and surveying services. The laboratory support services will include an onsite mobile laboratory to provide quick turnaround analyses of samples necessary to direct the soil excavation and removal, as well as conventional laboratory analytical support utilizing full QA/QC protocol for sample confirmation.

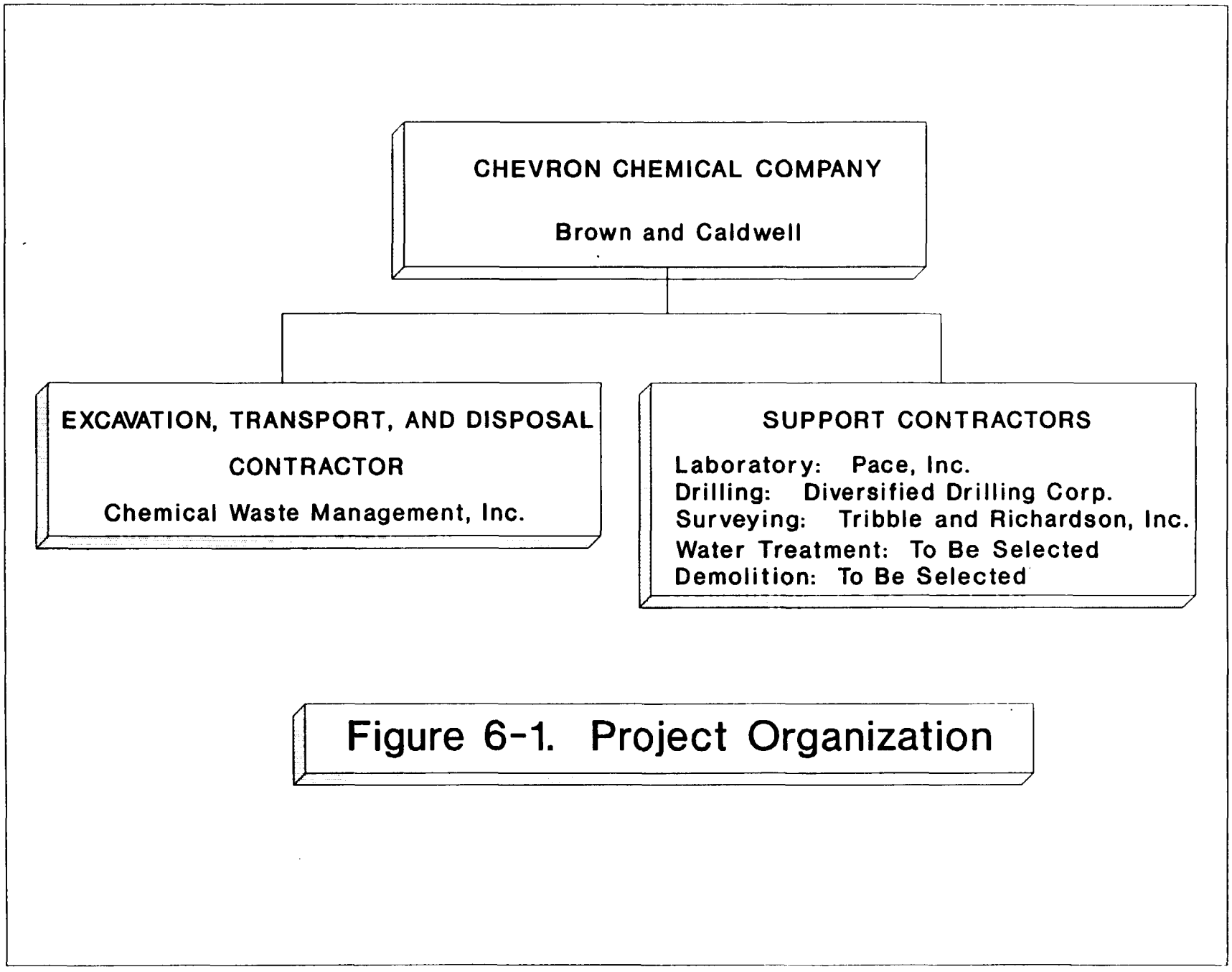


Figure 6-1. Project Organization

CHAPTER 7.0

PROJECT SCHEDULE

The removal action schedule is presented on Figure 7-1. Community relations, the site risk assessment, and negotiation of access agreements will begin upon submittal of the RAP. The groundwater investigation will be initiated upon EPA approval of the RAP, so that it may be completed prior to the startup of excavation activities. All other site work will begin following completion of the community relations activities, and will be completed within 100 days of initiation.

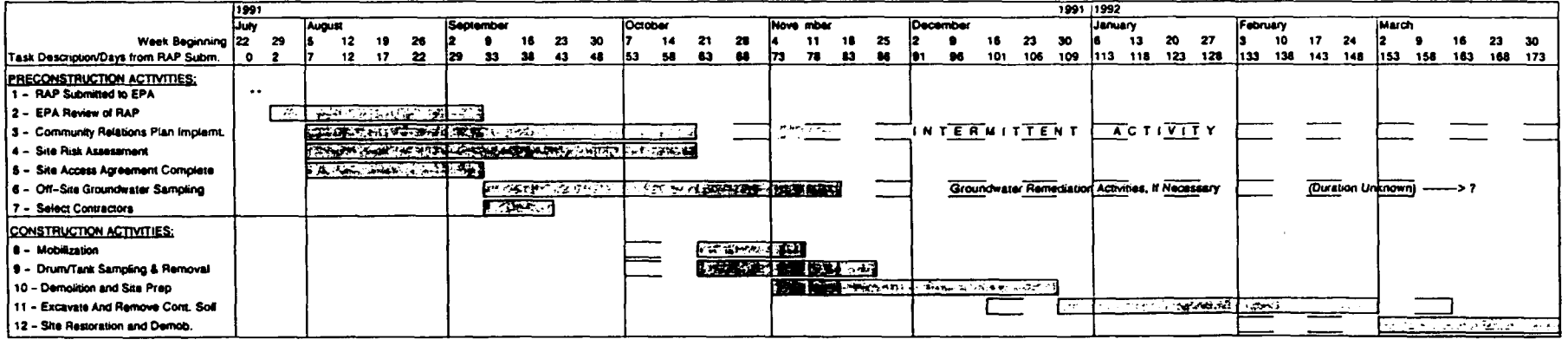
See Figure 7-1

The schedule for groundwater recovery and treatment will be determined based on the results of the groundwater investigation. The schedule for verification goal monitoring will be determined during the groundwater recovery and treatment period.

Figure 7-1.

Chevron Orlando - Removal Action Plan Schedule

July 19, 1991



Construction Activities include:

Mobilization:
- Install Fence/Screening
- Remove Surface Debris
- Asbestos Survey and Removal

Drum/Tank Sampling & Removal
- Sample/Disposal of Drums
- Sample/Removal of Storage Tanks
- Sample/Disp./Decon Floor Trench

Demolition and Site Prep
- Install Water Treatment System
- Construct Stormwater Detention Area
- Construct Soil Staging Area
- Office Building Demolition
- Surface Structure Demolition
- Remove Elevated Water Tank

Site Restoration and Demobilization
- Remove Temporary Structures
- Site Regrading
- Topsoil and Seeding
- Demobilization/Project Closeout

Note:

Denotes Float Time -

Brown and Caldwell Consultants

REFERENCES

1. United States Environmental Protection Agency, Region IV. Administrative Order of Consent. Chevron Chemical Company Site, Orange County, Florida. May 1990.

2. Brown and Caldwell. Contamination Assessment Report for the Chevron Chemical Company Site, Orlando, Florida (USEPA Docket No. 90-37-C). Prepared for Chevron Chemical Company. 1990.

3. Patry, J.J. Memo to file, Site Visit Central Florida Mack Truck, Orlando, Florida. June 1987.

4. Starosciak, N., Troutman, G.B., Uttal, R., Personal Communication. May 30, 1990.

APPENDIX A

LABORATORY ANALYSIS FROM

SEPTEMBER 1990 SAMPLING

Table A-1. Chevron Orlando Site Assessment
Shallow Soil Sample Analytical Results
September, 1990

		Sample Number														Cleanup
Parameter	Units	Sludge	SB-09	SB-10	SB-11	SB-12	SB-13	SB-14	SB-15	SB-16	SB-24	SB-25	SB-26	SB-28	SB-30	Goals
Depth	Ft.	1.5-2.0	1.5-2.0	1.5-2.0	1.5-2.0	1.5-2.0	1.5-2.0	1.5-2.0	1.5-2.0	1.5-2.0	1.5-2.0	1.5-2.0	1.5-2.0	1.5-2.0	1.5-2.0	
Type (Composite or Grab)	---	C	C	C	C	C	C	C	C	C	C	C	C	C	G	
Ethylbenzene	ug/kg	*	BDL	51	390	NA	NA	NA	NA	NA	NA	NA	1400	NA	NA	3E+06
Toluene	ug/kg	*	BDL	81	BDL	NA	NA	NA	NA	NA	NA	NA	930	NA	NA	3E+06
Xylenes	ug/kg	*	BDL	130	3300	NA	NA	NA	NA	NA	NA	NA	14000	NA	NA	4E+06
Chlorobenzene	ug/kg	*	BDL	140	BDL	NA	NA	NA	NA	NA	NA	NA	2400	NA	NA	32000
1,3-Dichlorobenzene	ug/kg	*	BDL	15	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
1,4-Dichlorobenzene	ug/kg	*	BDL	200	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	970	BDL	BDL	250000
Heptachlor	ug/kg	*	*	BDL	*	BDL	BDL	BDL	460	*	*	*	*	BDL	BDL	130
Endosulfan I	ug/kg	*	*	BDL	*	BDL	BDL	BDL	BDL	117000	*	*	*	BDL	BDL	13000
Dieldrin	ug/kg	*	*	BDL	*	BDL	BDL	BDL	1200	*	*	*	*	760	BDL	38
4,4'-DDE	ug/kg	*	*	BDL	*	BDL	BDL	BDL	1100	*	*	*	*	390	BDL	1800
4,4'-DDD	ug/kg	*	*	BDL	*	BDL	BDL	BDL	BDL	*	*	*	*	BDL	BDL	2500
4,4'-DDT	ug/kg	*	*	BDL	*	BDL	410	BDL	4200	*	*	*	*	980	BDL	18000
Endrin	ug/kg	*	*	BDL	*	BDL	BDL	BDL	1200	*	*	*	*	BDL	BDL	78000
Chlordane	ug/kg	NA	NA	1300	*	4600	73000	BDL	BDL	1E+06	760000	100000	87000	13000	BDL	470
Demeton-S	ug/kg	NA	NA	BDL	BDL	BDL	BDL	BDL	BDL	BDL	420	BDL	BDL	BDL	BDL	10000
Ethion	ug/kg	NA	NA	400	28	BDL	BDL	BDL	BDL	190000	54000	31	75	BDL	BDL	130000
Arsenic	mg/kg	NA	NA	2.8	BDL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.33
Chromium	mg/kg	NA	NA	4.6	1.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	52
Zinc	mg/kg	NA	NA	6.9	3.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	52000

BDL = below detectable limits
NA = not analyzed
* = detection limit elevated due to matrix interference

Table A-2. Chevron Orlando Site Assessment
Deep Soil Sample Analytical Results
September, 1990

Parameter	Units	Sample Number SB-17A	SB-17B	SB-18A	SB-18B	SB-19	SB-20	SB-21	SB-22A	SB-22B	SB-23A	SB-23B	SB-27	SB-29	SB-31	Cleanup Goal
Depth	Ft.	4.5-5.0	7.5-8.0	4.5-5.0	7.5-8.0	4.5-5.0	4.5-5.0	4.5-5.0	4.5-5.0	7.5-8.0	4.5-5.0	7.5-8.0	4.5-5.0	4.5-5.0	4.5-5.0	
Type (Composite or Grab)	—	G	G	G	G	G	G	G	G	G	G	G	G	C	C	
Ethylbenzene	ug/kg	2300	360	2100	510	BDL	BDL	1500	2200	64000	14000	*	NA	BDL	BDL	3E+07
Toluene	ug/kg	480	220	BDL	BDL	690	BDL	720	380	490	620	*	NA	BDL	BDL	5E+07
Xylenes	ug/kg	1600	4200	10000	3500	19000	26	6200	190000	470000	100000	1900000	NA	BDL	56	5E+08
Chlorobenzene	ug/kg	710	900	610	BDL	760	BDL	1800	130	300	BDL	*	NA	BDL	BDL	5E+06
1,3-Dichlorobenzene	ug/kg	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	*	NA	BDL	BDL	
1,4-Dichlorobenzene	ug/kg	3200	3800	BDL	BDL	BDL	BDL	3600	BDL	BDL	BDL	*	NA	BDL	BDL	250000
4,4'-DDD	ug/kg	68000	48000	17000	21000	180000	*	51000	*	40000	120000	92000	NA	BDL	BDL	2500
Chlordane	ug/kg	*	*	26000	*	170000	*	*	170000	250000	*	470000	NA	BDL	BDL	470
2-Methylnaphthalene	ug/kg	*	*	*	*	*	*	*	*	16000	41000	*	NA	BDL	BDL	
bis(2-Ethylhexyl) phthalate	ug/kg	*	*	*	*	*	*	*	*	*	*	*	NA	BDL	76000	43000
Chlorpyrifos	ug/kg	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1300	NA	NA	NA	780000
Demeton-O	ug/kg	62	82	170	170	210	BDL	BDL	220	200	490	1500	NA	NA	NA	10000
Demeton-S	ug/kg	200	220	57	57	1400	BDL	BDL	230	BDL	1100	210	NA	NA	NA	10000
Ethoprop	ug/kg	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	23	NA	NA	NA	
Naled	ug/kg	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	50	BDL	680	NA	NA	NA	520000
Phorate	ug/kg	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	28	58	NA	NA	NA	
Arsenic	mg/kg	BDL	1.1	BDL	1.6	3.5	BDL	BDL	1.2	1.7	BDL	BDL	1.4	1.3	BDL	0.35
Chromium	mg/kg	6.7	12	4.2	10	13	6.1	3.6	2.9	14	2.7	13	NA	5.4	1.4	8700
Zinc	mg/kg	16	3	2.6	4.3	BDL	BDL	BDL	13	52	7.8	7.4	NA	2.8	BDL	52000

BDL = below detectable limits
NA = not analyzed
* = detection limit elevated due to matrix interference

Table A-3. Chevron Orlando Site Assessment
Rail Spur Area Soil Sample Analytical Results
September, 1990

		Sample Number										Cleanup
Parameter	Units	SB-01	SB-02	SB-04A	SB-04B	SB-05A	SB-05B	SB-06	SB-07	SB-08	SB-35	Goals
Depth	Ft.	0-0.5	0-0.5	0-0.5	1.5-2	0-0.5	1.5-2	0-0.5	0-0.5	0-0.5	0-0.5	
Type (Composite or Grab)	---	G	G	G	G	G	G	G	G	G	G	
Ethylbenzene	ug/kg	BDL	BDL	7.7	1500	BDL	BDL	BDL	BDL	BDL	BDL	3E+06
Xylenes	ug/kg	BDL	57000	7.7	1100	BDL	BDL	BDL	BDL	BDL	BDL	4E+06
Chlorobenzene	ug/kg	BDL	1400	BDL	580	BDL	BDL	BDL	BDL	BDL	BDL	32000
1,2-Dichlorobenzene	ug/kg	BDL	12000	570	970	BDL	BDL	BDL	BDL	BDL	BDL	880000
1,3-Dichlorobenzene	ug/kg	BDL	840	120	140	BDL	BDL	BDL	BDL	BDL	BDL	
1,4-Dichlorobenzene	ug/kg	BDL	28000	1500	2800	BDL	380	BDL	BDL	BDL	BDL	250000
bis(2-Ethylhexyl)phthalate	ug/kg	BDL	610	*	*	*	350	*	*	*	BDL	43000
gamma-BHC	ug/kg	550	BDL	76000	*	*	BDL	*	*	*	BDL	470
delta-BHC	ug/kg	10000	2500	130000	*	*	BDL	*	320000	*	BDL	
beta-BHC	ug/kg	11000	1700	48000	*	*	BDL	*	81000	*	BDL	3400
alpha-BHC	ug/kg	420	BDL	2100000	*	*	BDL	*	72000	*	BDL	96
Heptachlor	ug/kg	BDL	580	*	*	*	BDL	*	*	*	BDL	130
Aldrin	ug/kg	BDL	BDL	*	*	5100	BDL	*	*	*	BDL	36
Dieldrin	ug/kg	BDL	1400	*	*	3500	BDL	*	*	*	380	38
4,4'-DDE	ug/kg	1400	2300	40000	*	7700	BDL	14000	160000	*	BDL	1800
4,4'-DDD	ug/kg	2200	1400	490000	56000	15000	BDL	18000	2E+06	*	BDL	2500
4,4'-DDT	ug/kg	4800	10000	*	*	*	BDL	13000	2E+06	*	BDL	18000
Chlordane	ug/kg	8200	13000	1400000	*	18000	BDL	*	160000	5100	43000	470
Ethion	ug/kg	BDL	BDL	140	650	BDL	BDL	BDL	BDL	BDL	BDL	130000
Arsenic	mg/kg	13	6.3	11	27	38	31	22	86	BDL	BDL	0.33
Chromium	mg/kg	2.3	2	16	2.4	14	2.6	18	26	6.4	1.5	52
Zinc	mg/kg	15	BDL	410	3.7	38	3.1	9.7	200	58	8.1	52000

BDL = below detectable limits
* = detection limit elevated due to matrix interference

Table A–4. Chevron Orlando Site Assessment
Groundwater Sample Analytical Results
September, 1990

		Well Identification													
Parameter	Units	MW–A	MW–D	MW–E	MW–F	MW–G	MW–H	MW–I	MW–J	MW–K	MW–L	MW–M	MW–N	MW–O	MW–P
Screen Interval	Ft. BLS	7–17	7–17	7–17	22–32	23–33	7–17	7–17	7–17	23–33	7–17	12–22	7–17	7–17	12–22
pH	units	5.83	6.42	5.78	5.58	5.76	7.69	6.08	7.03	5.4	6.99	6.15	6.12	5.52	4.99
Conductivity	umohs	195	140	485	150	260	2600	130	1750	260	1650	850	190	330	185
Temperature	Celsius	29.2	26.3	28.3	26.6	26.6	27.8	27.7	27.3	26.2	26.3	27.8	27.1	26.9	27
Benzene	ug/l	BDL	BDL	BDL	BDL	BDL	97	BDL	62	BDL	BDL	BDL	BDL	BDL	BDL
Toluene	ug/l	BDL	BDL	BDL	BDL	BDL	76	BDL	88	BDL	BDL	BDL	BDL	BDL	BDL
Xylene	ug/l	BDL	BDL	2500	15	920	1300	730	750	89	5500	BDL	BDL	420	BDL
Ethylbenzene	ug/l	BDL	BDL	BDL	5.7	180	220	350	140	39	930	BDL	1.5	BDL	BDL
Chlorobenzene	ug/l	BDL	BDL	BDL	5.1	BDL	130	BDL	130	BDL	BDL	BDL	2.7	BDL	BDL
Chloroform	ug/l	BDL	BDL	BDL	2.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,4–Dichlorobenzene	ug/l	BDL	BDL	BDL	BDL	BDL	72	BDL	150	BDL	49	BDL	1.5	BDL	BDL
1,1–Dichloroethane	ug/l	BDL	BDL	BDL	1.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2–Dichloroethane	ug/l	BDL	BDL	BDL	BDL	BDL	56	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1–Dichloroethene	ug/l	BDL	BDL	BDL	1.8	BDL	48	BDL	120	BDL	BDL	BDL	BDL	BDL	BDL
Methylene Chloride	ug/l	BDL	BDL	BDL	BDL	BDL	290	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2–Trichloroethane	ug/l	BDL	BDL	BDL	BDL	BDL	220	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Aldrin	ug/l	BDL	0.014	*	*	*	*	*	*	*	1.7	BDL	*	BDL	13
a–BHC	ug/l	BDL	BDL	*	5.1	0.37	2.4	*	15	*	2.1	0.027	3.6	21	4.5
b–BHC	ug/l	BDL	BDL	0.86	2.1	0.14	7.7	0.36	7.1	*	1.4	0.096	2.9	52	22
d–BHC	ug/l	BDL	BDL	*	4.2	0.29	*	0.23	11	*	*	0.02	5.8	21	5.9
g–BHC	ug/l	BDL	BDL	*	0.44	0.18	1.7	*	18	*	0.67	0.044	0.82	17	1.5
4,4'–DDD	ug/l	BDL	BDL	*	*	*	2.6	*	4.6	*	*	*	*	*	*
Dieldrin	ug/l	BDL	BDL	*	0.67	*	*	0.57	*	*	*	0.071	*	*	*
Endrin	ug/l	BDL	BDL	*	*	*	*	*	1.1	*	*	0.021	*	*	*
Endosulfan I	ug/l	BDL	BDL	*	0.15	0.3	*	*	*	*	*	*	*	*	*
Heptachlor	ug/l	BDL	BDL	*	0.26	*	*	*	*	*	*	*	0.13	*	*
Naphthalene	ug/l	BDL	BDL	26	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Isopherone	ug/l	BDL	BDL	BDL	BDL	BDL	56	BDL	44	BDL	56	BDL	BDL	BDL	BDL
2,4–Dimethylphenol	ug/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Phenol	ug/l	BDL	BDL	BDL	BDL	BDL	46	BDL	BDL	BDL	46	BDL	BDL	BDL	BDL

Table A-4. Chevron Orlando Site Assessment
Groundwater Sample Analytical Results (Continued)
September, 1990

Parameter	Units	Well Identification MW-A	MW-D	MW-E	MW-F	MW-G	MW-H	MW-I	MW-J	MW-K	MW-L	MW-M	MW-N	MW-O	MW-P
Demeton-O	ug/l	BDL	BDL	2.5	BDL	BDL	130	BDL	46	BDL	21	BDL	BDL	1.1	BDL
Ethyl Parathion	ug/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	110
Methyl Parathion	ug/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.16
Arsenic	mg/l	BDL	BDL	BDL	BDL	BDL	0.03	BDL	0.025	BDL	0.082	BDL	BDL	BDL	BDL
Chromium	mg/l	* 0.1	0.011	0.015	BDL	0.17	0.011	BDL	0.031	BDL	0.038	BDL	BDL	BDL	0.059
Zinc	mg/l	0.054	0.035	0.025	BDL	0.02	BDL	BDL	0.041	0.024	BDL	0.027	0.042	0.044	0.053

BDL = below detectable limits
NA = not analyzed
* = detection limit elevated due to matrix interference

APPENDIX B

SOIL BORING LOGS

2 4 0079

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-18

CODE: SPT-2 TIME: 1300

METHOD: Split spoon LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Dark brn sandy top soil		
2-4	Brn fg sand		damp
4-6	as above		saturated
6-8	as above		wet at 7'
8-10	8-9' Brn fg sand 9-10' Grey clayey sand		stiff

2 4 0080

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-18

CODE: SPT-3 TIME: 1400

METHOD: Split spoon LOGGER: Lisa

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	vdk brn sandy top soil (organic looking)		
2-4	lt. gybrn fg sand		damp
4-6	3" tan fg sand 21" Brn-dk brn fg silty sand		saturated wet
6-8	Brn-vdk brn silty sand		wet
8-10	as above		

2 4 0081

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-18

CODE: SPT-4 TIME: 1430

METHOD: Split spoon LOGGER: Lisa

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Brown organic top soil		
2-4	Tan - ltgy brn fg sl. clayey sand		damp
4-6	Ltgybrn - brn fg sand (sl. clayey)		saturated
6-8	gybrn - brn fg silty sand		wet
8-10	as above		

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-18

CODE: Spt - 5 TIME: 1500

METHOD: Split spoon LOGGER: Lisa

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Brn sandy top soil		
2-4	Tan fg sand		damp
4-6	12 in gy brn fg sand 12 in dk brn fg sand		saturated
6-8	vdk brn sand		wet
8-10	A/A 9-10' Grey sandy clay		

2 4 0083

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando **DATE:** 6-18

CODE: Spt-6 **TIME:** 1530

METHOD: Split spoon **LOGGER:** L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Dk brn top soil		
2-4	gy ish tan fg sand		damp
4-6	gy brn fg sand		saturated pest. odor
6-8	tan-brn fg sand		wet at 7' odor
8-10	Brn sand 9-10' tan-gy st. clayey sand		odor

2 4 0084

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-18

CODE: Spt. 7 TIME: 1600

METHOD: LOGGER: L Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Dk brn sandy top soil		
2.4	Brn fg sand		
4-6	lt brn fg sand		saturated odor
6.8	Dk brn fg sand		wet slight odor
8-10	AS/Above		odor

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-13

CODE: SPT-8 TIME: 1555

METHOD: Split Spoon LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk sandy top soil		
2-4	2-3' Tan fg sand 3-4' Brn fg sand		
4-6	4-5' Tan to gy mottled fg sand tr clay 5-6' dk brn silty sand		5.5' saturated
6-8	Dk brn silty sand		7' wet
8-10	Brn - vdk brn silty sand		

SOIL BORING CONSTRUCTION LOG 24 .0086

PROJECT: Chevron orlando DATE: 6-13

CODE: Spt - 9 TIME: 1345

METHOD: Split spoon LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Brn sandy top soil		
2-4	Tan - lt brn fg sand		
4-6	4-4.5 Tan fg sand 4.5-6 Dk brn fg sand		wet at 5'
6-8	Vdk brn silty sand 3" dk brn + gy mottled clayey sand		
8-10	Vdk brn sand + tan sand, tr clay		

2 4 0087

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-13

CODE: Spt - 10 TIME: 1100

METHOD: Split spoon LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk sandy top soil (organic looking)		
2-4	Tan fg sand mottled w/ orange (iron stained) sand 3.5-4' Brn sand		
4-6	4-5.5' Blk sand mottled w/ white is pebbles 5.5-6 Tan fg sand		5.5 damp
6-8	6-7' Dk gy-blk mottled w/tan fg sand 7-8 Dk gy brn 'mucky' sand		Saturated
8-10	Dk brn 'mucky' fg sand		wet

2 4 0088

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-13

CODE: Spt -11 TIME: 1430

METHOD: Split spoon LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Dk brn - blk sandy some tan fg sand top soil		
2-4	4" dk brn fg sand 20" tan vfg - fg sand		
4-6	4" blk organic fg sandy soil 16" tan vfg - fg sand 4" BRN SILTY SAND		damp
6-8	vdk brn silty sand		wet at 7'
8-10	v dk red brn silty sand		

2 4 0089

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-13

CODE: Spt-12 TIME: 1445

METHOD: Split spoon LOGGER: L Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk sandy top soil		
2-4	Tan-gy vfg-fg sand grades to Brn fg sand		
4-6	Tan-dk brn fg sand		damp
6-8	6" Tan fg sand 18" vdk brn fg sand		wet at 6.5
8-10	dk brn ~~fg~~ sand		

2 4 0090

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando **DATE:** 6-13

CODE: Spt-13 **TIME:** 1300

METHOD: Split spoon **LOGGER:** L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk fg sandy top soil w/occ. white ls pebbles		
2-4	2-3' Tan-gy mottled fg sand tr gy clay 3-4' Brn fg sand		
4-6	4-5' Tan-gy mottled fg sand 5-5.8' Tan-brn silty sand 5.8-6' - dk brn sand		damp at 5.8'
6-8	Brn-tan fg sand, srne gy clay DK brn 'mucky' sand		wet at 7'
8-10	DK brn fg sand		

2 4 0091

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando **DATE:** 6-13

CODE: Spt-14 **TIME:** 1330

METHOD: Split spoon **LOGGER:** L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	DK brn fg sandy topsoil		
2-4	2-2.5 DK sandy soil w/wh ls frags 2.5-4 Tan mottled w/gy fg sand w/ clay		
4-6	9" Tan fg sand 15" DK brn fg sand		damp at 5'
6-8	20% Recovery DK brn - tan fg sand		DRY
8-10	DK brn sand 9.5-10 Tan fg sand		DAMP at 9' WET at 9.5

2 4 0092

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6.13

CODE: Spt-15 TIME: 1300

METHOD: Split spoon LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	BK sandy top soil		
2-4	Tan & gy mottled fg sand		Strong diesel odor
4-6	8" gy-tan clayey sand 16" dk brn silty sand		damp
6-8	6" lt brn-tan clayey sand 18" Dk brn sand, tr clay (mucky)		wet at 7'
8-10	Dk brn fg clayey sand		

2 4 0093

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando **DATE:** 6-17

CODE: Spt-16 **TIME:** 1830

METHOD: Split spoon **LOGGER:** L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Asphalt - 4" 6" Tan fg sand 14" Brn sandy top soil		
2-4	gyish-tan fg sand		odor
4-6	Brn fg sand Sme gy brn fg sand		Saturated odor
6-8	Dk brn silty sand		wet strong odor
8-10	Dk brn silty sand		strong odor

2 4 0094

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-17

CODE: Spt-17 TIME: 1900

METHOD: Split Spoon LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Gy brn sandy top soil		
2-4	DK brn + tan mottled fg sand		damp
4-6	Brn - vdk brn fg silty sand		saturated odor
6-8	Brn fg silty sand		saturated
8-10	as above		wet

SOIL BORING CONSTRUCTION LOG 24 0095

PROJECT: Chevron Orlando DATE: 6-18

CODE: Spt-18 TIME: 0915

METHOD: Split spoon LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk sandy top soil		
2-4	Brn fg sand		damp
4-6	A/A		saturated slight odor
6-8	A/A		wet sl. odor
8-10	6" dk brn fg sand 18" ltgy brn fg sand		wet odor

2 4 0096

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6·18

CODE: Spt-19 (A) TIME: 0945

METHOD: Split spoon LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	DK brn sandy top soil		
2-4	lt gy - tan fg sand		
4-6	lt brn fg sand		sat.
6 8	AS Above		~~sat.~~ wet
8-10	as above		wet

2 4 0097

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-18

CODE: Spt - 20 TIME: 0830

METHOD: Split spoon LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0 - 2	Blk sandy top soil		
2 - 4	gy tan - ltbrn fg sand		saturated
4-6	Brn fg sand		saturated
6- 8	Dk brn fg silty sand		wet
8-10	As/Above		

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-18

CODE: Spt-21 TIME: 0800

METHOD: Split spoon LOGGER: Lisa

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk sandy top soil some white fg sand		
2-4	Tan-brn fg sand		
4-6	Brn-dk brn fg sand		saturated
6-8	wood fibers, brn fg sand 10% recovery		wet
8-10	Brn fg sand		

2 4 0099

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-17

CODE: Spt - 24 TIME: 1700

METHOD: Split spoon LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk fg sandy top soil		
2-4	greyish tan fg sand		saturated
4-6	Tan-dk brn fg sand		wet
6-8	vdk brn fg silty sand		wet
8-10	As/Above		wet

2 4 0100

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6.17

CODE: Spt-25 TIME: 1730

METHOD: Split spoon LOGGER: Lisa

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	BK fg sandy top soil		
2-4	Tan brn fg sand		damp
4-6	Brn silty sand		saturated
6-8	vdk brn - dk gybrn silty sand		wet
8-10	dk brn silty sand		

2 4 0101

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-18

CODE: Spt-26 TIME: 1000

METHOD: Split Spoon LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk sandy top soil		
2-4	greyish tan fg sand		damp
4-6	3" Tan fg sand 21" dk brn fg silty sand		saturated
6-8	Dk brn fg silty sand		wet
8-10	as above		

SOIL BORING CONSTRUCTION LOG

2 4 0102

PROJECT: Chevron Orlando DATE: 6-18

CODE: Spt 27 TIME: 1100

METHOD: Split spoon LOGGER: LMorrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	white concrete - 3" dk brn sandy top soil		
2-4	Tan + dk brn mottled fg sand		damp
4-6	12" Grey clayey sand 12" Dk brn fg silty sand		saturated
6-8	dk brn fg silty sand		odor wet
8-10	dk brn fg sand, mottled w/dk gy clayey sand		odor

2 4 0103

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-18

CODE: Spt-28 TIME: 1130

METHOD: Split spoon LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Lt. brn fg sand		
2-4	lt brn - dk brn fg sand		damp strong odor
4-6	dk brn v fg silty sand		odor saturated
6-8	v dk brn fg sand		odor wet
8-10	as above		odor

2 4 0104

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-17

CODE: Spt-29 TIME: 1800

METHOD: Split Spoon LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Asphalt Blk sandy top soil		
2-4	12" tan-gy fg sand 12" Dk brn fg sand		pet. odor Damp
4-6	12" lt gybrn fg sand 12" lk brn silty fg sand		sat. 5' odor
6-8	v lk brn silty sand		wet 7' odor
8-10	As Above		strong odor

2 4 0105

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-13

CODE: Spt - 30 TIME: 1000

METHOD: Split spoon LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk organic fg sand		xylene? odor
2-4	Tan mottled w/gy fg sand		damp
4-6	4-4.5 gy sand mottled w/blk 4.5 6 brn-dk brn fg sand		saturated at 5.5'
6-8	3" gy fg sand 21" brn-vdk brn fg silty sand		wet at 7' strong odor
8-10	Brn sand 9.5-10' Tan fg sand		petroleum sheen

2 4 0106

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-13

CODE: Spt-31 TIME: 1030

METHOD: Split Spoon LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk fg sand + sme white lS rock fragments		strong odor
2-4	2-2.5 dk brn fg sand 2.5-4 tan-ltbrn fg sand		
4-6	4-4.5 tan mottled w/gy sand 4.5-6 dk brn sand		saturated 5'
6-8	dk brn fg sand and organic 'muck'		wet 7'
8-10	dk brn sand + 'muck'		

2 4 0107

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-13

CODE: Spt - 32 TIME: 0800

METHOD: Spl. t Spoon LOGGER: LMorrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk fg ~~Sandy~~ top soil		
2-4	2-2.5 blk-gy fg sand 2.5-4 gy-tan fg sand		
4-6	Tan-dk brn clayey sand		damp 5'
6-8	Brn-vdk brn silty sand (organic 'muck')		saturated
8-10	vdk brn silty sand		wet

2 4 0108

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-12

CODE: Spt - 33 TIME: 1730

METHOD: Split spoon LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Gy brn fg sand		
2-4	Sand - gy-ltbrn occ. ls pebble 3-4 Brn-mg sand		
4-6	Gy-ltbrn vf-fg sand mottled w/wh ls pebbles		DAMP
6-8	6-7 ltgy-tan fg sand 7-8 vdkbrn sand, tr clay		WET AT 7'
8-10	vdkbrn fg sand, tr silt		wet

2 4 0109

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-12

CODE: Spt-34 TIME: 1630

METHOD: Split spoon LOGGER: L Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Dk gy-blk vfg sand		
2-4	2-2.5 vdkgy-blk fg sand 2.5-4 Tan-wh fg sand		
4-6	Dk brn-vdk brn vfg sand sme silt		wet at 5'
6-8	A/A		
8-10	Dk brn sand, fg 'organic'		

2 4 0110

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando **DATE:** 6-12

CODE: SPT-35 **TIME:** 1700

METHOD: Split spoon **LOGGER:** L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Gy-brn vfg-fg sand		
2-4	2-3 dk brn vfg sand 3-4 tan-brn vfg sand		
4-6	vdk brn 'organic' sand sme clay, occ ls pebble		
6-8	6-7 wh-tan fg sand, mottled brn 7-8 vdk brn fg sand		WET AT 7'
8-10	vdk brn fg sandy sme clay		

2 4 0111

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-13

CODE: Spt-36 TIME: 0900

METHOD: Split Spoon LOGGER: L Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk fg sand		
2-4	2-3 Tan fg sand 3-4 Gybrn fg sand		
4-6	4-4.5 Blk + wh mottled sand + 1s pebbles 4.5-6 brn-dkbrn fg sand		saturated 5'
6-8	dkbrn - vdk reddish brn fg sand		wet 7'
8-10	vdk brn fg sand		

2 4 0112

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-13

CODE: Spot-37 TIME: 0950

METHOD: _____ LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Asphalt 6 in Blk organic fg sand		xylene odor TIP. 4 ppm
2-4	gybrn fg sand		odor
4-6	brn-vdkbrn silty sand		odor saturated 5'
6-8	vdkbrn silty fg sand		wet 7'
8-10	As above		

2 4 0113

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando **DATE:** 6-14

CODE: Spt-38 **TIME:** 1300

METHOD: _____ **LOGGER:** Lisa

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Asphalt Gybrn fg sand		
2-4	Dk brn fg sand Tan-gybrn fg sand		
4-6	10" Tan & gy fg sand Dk brn fg sand		saturated 5'
6-8	10" Gy-tan fg sand Dk brn silty fg sand		wet 7'
8-10	A/A		

2 4 0114

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-13

CODE: Spt-39 TIME: 1630

METHOD: _____ LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk organic sand		strong odor
2-4	Brn + tan fg sand		"
4-6	Tan sand Gy sand, clayey 5-6'		odor sl. wet
6-8	Tan-brn fg clayey sand		wet odor
8-10	Brn-dk brn fg sand mottled w/gy clayey sand		odor

2 4 0115

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-14

CODE: Spt · 40 TIME: 1315

METHOD: _____ LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	2" Concrete Blk fg sandy top soil		
2-4	lt gy-dk brn fg sand w/occ. wh sand		damp
4-6	no Recovery		~~[illegible]~~
6-8	6-7 vdk brn silty sand 7-8 · Dk tan-gy brn fg sand		wet
8-10	as above		

2 4 0116

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-17

CODE: Spt 41 TIME: 1430

METHOD: _____ LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	BLK fg sandy top soil		
2-4	v dk brn silty sand		wet
4-6	A/A		wet
6-8	BRN silty vfg sand		wet
8-10	Lt brn - dk brn fg sand		wet

2 4 0117

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-17

CODE: Spt-42 TIME: 1600

METHOD: _____ LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk sandy top soil		
2-4	6" DK brn fg sand 8" Tan fg sand 10" Gybrn fg sand		damp
4-6	12" gy brn fg sand 12" tan-brn fg sand		wet
6-8	Ltgy brn fg sand - 12" 12" tan-brn fg sand		wet
8-10	Tan-brn fg silty sand		

2 4 0118

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-17

CODE: Spt - ~~#~~ 43 TIME: ~~1000~~ 1530

METHOD: ~~Spl.~~ Split spoon LOGGER: Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk sandy top soil		
2-4	Tan fg sand		damp
4-6	gybrn-brn fg sand		sat.
6-8	lt brn silty sand		wet
8-10	as above		

2 4 0119

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando **DATE:** 6-14

CODE: Spt-44 **TIME:** 1400

METHOD: _____ **LOGGER:** L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk sandy top soil		
2-4	3" dk brn fg sand Brn fg sand		Damp
4-6	v dk brn silty sand		sat.
6-8	v dk brn silty sand tr clay		wet
8-10	brn silty sand		

2 4 0120

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando **DATE:** 6-14

CODE: Spt - 4S **TIME:** 1340

METHOD: _____ **LOGGER:** Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	4" Concrete Dk fg sandy top soil		
2-4	DK brn fg sand 12" Brn sand, tr silt		
4-6	Brn fg sand		saturated 4-5'
6-8	As Above		wet
8-10	As Above 9-10 Dk gybrn clayey sand		

2 4 0121

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron DATE: 6-14

CODE: Spt-46 TIME: 1330

METHOD: _____ LOGGER: L Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	2" Concrete Blk sandy top soil		
2-4	Dk brn w/blk mottling Silty fg sand		Damp
4-6	Dk brn - brn silty sand		wet
6-8	As above		
8-10	As above		

2 4 0122

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando **DATE:** 6-14

CODE: Spt - 47 **TIME:** 0730

METHOD: _____ **LOGGER:** L. MORRISON

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk sandy top soil		
2-4	Brn, blk, gy mottled sand		odor
4-6	tan-brn fg sand		oil sheen sat. at 5.5
6-8	lt brn fg sand mottled w/grey clayey sand		wet
8-10	as/above		

2 4 0123

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: ~~6-14~~ 6-13

CODE: Spt-48 TIME: ~~0930~~ 1700

METHOD: _____ LOGGER: L Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	6-12" of concrete ~~Blk~~ s 2' blk organic sandy soil		
2-4	6"- blk fg sand 18"- tan-ltbrn fg sand		
4-6	tan-brn fg silty sand		damp
6-8	1' - ltgy-brn fg sand, tr clay 1'- dkbrn silty sand		wet
8-10	As above		

2 4 0124

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-14

CODE: Spt-49 TIME: 0745

METHOD: _____ LOGGER: L Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	7" Concrete Blk sandy top soil		strong pesticide odor
2-4	Brn-tan fg sand		damp at 3' odor
4-6	Brn-tan fg sand mottled w/ grey clayey sand		strong odor wet oil sheen
6-8	As Above		wet, odor sheen
8-10	Dk brn fg silty sand		As Above

2 4 0125

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando **DATE:** 6-14

CODE: Spt-50 **TIME:** 0800

METHOD: _____ **LOGGER:** LMorrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	6" concrete Blk sandy soil		Pesticide or Petroleum odor
2-4	DK tan-brn fg sand		oily looking
4-6	Tan fg sand		as above wet
6-8	Brn fg silty sand		
8-10	Brn-dk brn sand 9-10' tan clayey sand grading to dk brn sand		

2 4 0126

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando **DATE:** 6-14

CODE: Spt - SI **TIME:** 0915

METHOD: _____ **LOGGER:** L Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	6" concrete 4" Lt brn fg sand 14" dk brn sandy + s		
2-4	vdk brn fg sand		damp
4-6	4-4.5 vdk brn sand 4.5-6 lt brn-tan fg sand		saturated
6-8	v dk brn-tan fg sand		wet
8-10	vdk brn - lt brn fg sand		

2 4 0127

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-14

CODE: Spt-52 TIME: 1415

METHOD: _____ LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk sandy top soil		
2-4	vdk brn silty sand		saturated 3'
4-6	As above		wet - 5'
6-8	vdk brn - blk fg silty sand		
8-10	As above		

2 4 0128

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-14

CODE: Spt 53 TIME: 1430

METHOD: _____ LOGGER: Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk sandy top soil		
2-4	DK brn sand Tan-Hbrn sand		damp
4-6	Tan-dk brn vf-fg sand		sat.
6-8	Brn-dk brn silty sand		wet
8-10	As above		

2 4 0129

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-14

CODE: Spt 54 TIME: 1000

METHOD: LOGGER: L. Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk sandy top soil		
2-4	Lt brn fg sand		Sat. 3.5'
4-6	dk brn fg sand + clay		wet 5'
6-8	Dk brn fg silty sand		
8-10	v lt ~~brn~~ gy brn vfg sand		

2 4 0130

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-14

CODE: SPT-SS TIME: 1030

METHOD: LOGGER: Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	BLK sandy top soil		
2-4	LT brn sand (mucky)		sat.
4-6	vdk brn silty sand w/wh ls pebbles in top 3"		damp
6-8	vdk brn silty sand		odor sat.
8-10	as above		odor wet

2 4 0131

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando **DATE:** 6-14

CODE: Spt - 56 **TIME:** 1100

METHOD: _____ **LOGGER:** Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk sandy top soil		
2-4	lt brn sand		sat, sl. odor
4-6	alternating tar & lt brn fg sand		wet
6-8	as above		
8-10	vdk brn fg sand		oily looking

2 4 0132

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-17

CODE: Sp+-57 TIME: 10-45

METHOD: _____ LOGGER: MORRISON

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk sandy top soil		
2-4	tan brn fg sand		
4-6	Brn-gybrn fg sand		sat. 5'
6-8	dk gybrn-dk brn fg silty sand		sat.
8-10	vdk brn silty sand		wet

2 4 0133

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-17

CODE: Spt -SE TIME: 1200

METHOD: _____ LOGGER: Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Dk brn sandy ts		
2-4	Brn fg sand		
4-6	by brn - dk brn silty sand		damp
6-8	vdk gy brn fg sand		sat.
8-10	vdk brn silty sand		wet

2 4 0134

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-17

CODE: Spt-39 TIME: 1230

METHOD: _____ LOGGER: Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	Blk sandy top soil		
2-4	lt gybrn-dk gybrn fg sand, tr clay		damp
4-6	gybrn fg sand		sat. very hard
6-8	vdkbrn fg silty sand		wet
8-10	as above		wet strong odor

2 4 0135

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-17

CODE: ~~Spt~~-60 TIME: 1250

METHOD: _____ LOGGER: Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	tan-orang brn sand		
2-4	brn fg sand		
4-6	drbrn fg sand		very hard at 5' samp
6-8	NO recovery		wet
8-10	vdkbrn silty sand		

2 4 0136

SOIL BORING CONSTRUCTION LOG

PROJECT: _____ **DATE:** 6-17

CODE: Spt 61 **TIME:** 1330

METHOD: _____ **LOGGER:** Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	DK brn sandy top soil		
2-4	Brn fg silty sand		
4-6	tan-dk brn fg sand		damp
6-8	vdk brn silty sand		sat.
8-10	as above		wet

2 4 0137

SOIL BORING CONSTRUCTION LOG

PROJECT: Chevron Orlando DATE: 6-17

CODE: Spt-62 TIME: 1500

METHOD: _____ LOGGER: Morrison

DEPTH INTERVAL	FORMATION DESCRIPTION	BLOWS PER 6 IN.	COMMENTS
0-2	gy brn fg sand		
2-4	ltgybrn-dk brn fg sand		
4-6	as above		damp v. hard SI
6-8	dk brn silty sand		sat.
8-10	as above		wet

APPENDIX C

MOBILE LABORATORY ANALYSIS FROM JUNE 1991 SAMPLING

REPORT OF LABORATORY ANALYSIS

Brown & Caldwell
5110 Eisenhower Boulevard
Suite 230
Tampa, FL 33634

July 05, 1991
PACE Project Number: 210611504

Attn: Mr. Jim Linton

Chevron/Orlando

PACE Sample Number:			90 0093390	90 0093403	90 0093411
Date Collected:			06/17/91	06/17/91	06/17/91
Date Received:			06/19/91	06/19/91	06/19/91
Parameter	Units	MDL	MW-L	MW-J	MW-N
SUBCONTRACT ANALYSIS					
INDIVIDUAL PARAMETERS					
Total Organic Carbon	mg/L	1.0	200	130	46
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Calcium ICP	mg/L	0.2	15	14	18
Chloride	mg/L	1.0	170	86	16
Hardness, Total	mg/L	1	18	2.6	38
Iron ICP	mg/L	0.3	8.9	8.8	2.5
Magnesium ICP	mg/L	0.02	2.7	3.3	2.8
Manganese ICP	mg/L	0.05	ND	ND	ND
Nitrogen, Nitrate	mg/L	1.0	ND*	ND*	ND*
Sodium ICP	mg/L	1	140	60	14
Solids, Total	mg/L	5	4900	7400	1700
Solids, Total Dissolved	mg/L	5	1400	2400	340
Sulfate	mg/L	5	49	14	17

MDL Method Detection Limit
ND Not detected at or above the MDL.
* Analyzed two days out-of-holding time.

Lab Certification: Florida Environmental: HRS #E84003; Florida SDWA: HRS #84125

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/13/91	6/13/91	6/13/91
Date Analyzed:	6/15/91	6/15/91	6/13/91
Sample Number:	10 700166.5	10 700167.3	10 700121.5
Run Number:	071	073	006
Sample Description:	SPT-12-01	SPT-12-02	SPT-09-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/13/91	6/13/91	6/13/91
Date Analyzed:	6/17/91	6/14/91	6/15/91
Sample Number:	10 700122.3	10 700159.2	10 700161.4
Run Number:	164	055	077
Sample Description:	SPT-09-02	SPT-08-01	SPT-08-02

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/13/91	6/13/91
Date Analyzed:	6/14/91	6/13/91
Sample Number:	10 700160.6	10 700124.
Run Number:	057	009
Sample Description:	DUP-08-01	SPT-10-01

FIELD ANALYSIS

PESTICIDES	Units	MDL		
g-Chlordane	mg/kg	10	ND	ND
a-Chlordane	mg/kg	10	ND	ND
4,4-DDD	mg/kg	10	ND	ND
4,4-DDT	mg/kg	10	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/13/91	6/13/91	6/13/91
Date Analyzed:	6/14/91	6/15/91	6/15/91
Sample Number:	10 700125.8	10 700163.	10 700164.9
Run Number:	027	074	076
Sample Description:	SPT-10-02	SPT-11-01	SPT-11-02

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/13/91	6/13/91	6/13/91
Date Analyzed:	6/17/91	6/17/91	6/17/91
Sample Number:	10 700127.4	10 700128.2	10 700130.4
Run Number:	168	163	161
Sample Description:	SPT-13-01	SPT-13-02	SPT-14-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/13/91	6/13/91	6/13/91
Date Analyzed:	6/17/91	6/15/91	6/15/91
Sample Number:	10 700131.2	10 700169.	10 700170.3
Run Number:	162	065	067
Sample Description:	SPT-14-02	SPT-15-01	SPT-15-02

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	29	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/13/91	6/13/91	6/13/91
Date Analyzed:	6/14/91	6/14/91	6/14/91
Sample Number:	10 700133.9	10 700134.7	10 700136.3
Run Number:	037	036	038
Sample Description:	SPT-30-01	SPT-30-02	SPT-31-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	11	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	36	55	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/13/91	6/13/91
Date Analyzed:	6/14/91	6/14/91
Sample Number:	10 700137.1	10 700138.
Run Number:	039	040
Sample Description:	SPT-31-02	DUP-31-01

FIELD ANALYSIS

PESTICIDES	Units	MDL		
g-Chlordane	mg/kg	10	ND	ND
a-Chlordane	mg/kg	10	ND	ND
4,4-DDD	mg/kg	10	ND	ND
4,4-DDT	mg/kg	10	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/13/91	6/13/91	6/12/91
Date Analyzed:	6/14/91	6/14/91	6/14/91
Sample Number:	10 700140.1	10 700141.	10 700143.6
Run Number:	041	042	046
Sample Description:	SPT-32-01	SPT-32-02	SPT-33-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/12/91	6/12/91	6/12/91
Date Analyzed:	6/14/91	6/14/91	6/14/91
Sample Number:	10 700144.4	10 700146.	10 700147.9
Run Number:	047	048	049
Sample Description:	SPT-33-02	SPT-34-01	SPT-34-02

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/13/91	6/13/91	6/12/91
Date Analyzed:	6/14/91	6/14/91	6/14/91
Sample Number:	10 700149.5	10 700150.9	10 700155.
Run Number:	050	051	063
Sample Description:	SPT-36-01	SPT-36-02	SPT-35-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/12/91	6/12/91
Date Analyzed:	6/14/91	6/14/91
Sample Number:	10 700157.6	10 700156.8
Run Number:	061	059
Sample Description:	SPT-35-02	DUP-35-01

FIELD ANALYSIS

PESTICIDES	Units	MDL		
g-Chlordane	mg/kg	10	ND	ND
a-Chlordane	mg/kg	10	ND	ND
4,4-DDD	mg/kg	10	ND	ND
4,4-DDT	mg/kg	10	ND	ND

MDL = Method Detection Limit

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/13/91	6/13/91	6/14/91
Date Analyzed:	6/14/91	6/16/91	6/15/91
Sample Number:	10 700152.5	10 700153.3	10 700200.9
Run Number:	052	140	098
Sample Description:	SPT-37-01	SPT-37-02	SPT-38-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	11	17	ND
a-Chlordane	mg/kg	10	ND	11	ND
4,4-DDD	mg/kg	10	38	63	ND
4,4-DDT	mg/kg	10	ND	23	ND

MDL = Method Detection Limit

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/14/91	6/13/91	6/13/91
Date Analyzed:	6/15/91	6/15/91	6/16/91
Sample Number:	10 700201.7	10 700172.	10 700173.8
Run Number:	099	069	131
Sample Description:	SPT-38-02	SPT-39-01	SPT-39-02

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	41	44
a-Chlordane	mg/kg	10	ND	31	26
4,4-DDD	mg/kg	10	12	130	140
4,4-DDT	mg/kg	10	ND	13	ND

MDL = Method Detection Limit

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/14/91	6/14/91	6/14/91
Date Analyzed:	6/16/91	6/15/91	6/15/91
Sample Number:	10 700197.5	10 700198.3	10 700188.6
Run Number:	143	095	093
Sample Description:	SPT-40-01	SPT-40-02	SPT-44-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/14/91	6/14/91	6/14/91
Date Analyzed:	6/15/91	6/16/91	6/16/91
Sample Number:	10 700189.4	10 700191.6	10 700192.4
Run Number:	094	139	133
Sample Description:	SPT-44-02	SPT-45-01	SPT-45-02

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/14/91	6/14/91	6/14/91
Date Analyzed:	6/15/91	6/15/91	6/15/91
Sample Number:	10 700194.	10 700195.9	10 700206.8
Run Number:	096	097	106
Sample Description:	SPT-46-01	SPT-46-02	SPT-47-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/14/91	6/13/91	6/13/91
Date Analyzed:	6/15/91	6/15/91	6/15/91
Sample Number:	10 700207.6	10 700175.4	10 700176.2
Run Number:	108	079	080
Sample Description:	SPT-47-02	SPT-48-01	SPT-48-02

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/14/91	6/14/91	6/14/91
Date Analyzed:	6/15/91	6/15/91	6/15/91
Sample Number:	10 700209.2	10 700210.6	10 700212.2
Run Number:	147	104	113
Sample Description:	SPT-49-01	SPT-49-02	SPT-50-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/14/91	6/14/91	6/14/91
Date Analyzed:	6/15/91	6/15/91	6/15/91
Sample Number:	10 700213.	10 700215.7	10 700216.5
Run Number:	114	110	111
Sample Description:	SPT-50-02	SPT-51-01	SPT-51-02

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/14/91	6/14/91	6/14/91
Date Analyzed:	6/15/91	6/15/91	6/16/91
Sample Number:	10 700181.9	10 700182.7	10 700184.3
Run Number:	091	092	138
Sample Description:	SPT-53-01	SPT-53-02	DUP-53-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/14/91	6/14/91
Date Analyzed:	6/16/91	6/16/91
Sample Number:	10 700178.9	10 700179.7
Run Number:	136	137
Sample Description:	SPT-52-01	SPT-52-02

FIELD ANALYSIS

PESTICIDES	Units	MDL		
g-Chlordane	mg/kg	10	ND	ND
a-Chlordane	mg/kg	10	ND	ND
4,4-DDD	mg/kg	10	ND	ND
4,4-DDT	mg/kg	10	ND	ND

MDL = Method Detection Limit

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/14/91	6/14/91	6/14/91
Date Analyzed:	6/16/91	6/15/91	6/15/91
Sample Number:	10 700218.1	10 700219.	10 700221.1
Run Number:	144	119	116
Sample Description:	SPT-54-01	SPT-54-02	SPT-55-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/14/91	6/14/91	6/14/91
Date Analyzed:	6/15/91	6/16/91	6/16/91
Sample Number:	10 700222.	10 700203.3	10 700204.1
Run Number:	117	134	135
Sample Description:	SPT-55-02	SPT-56-01	SPT-56-02

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/12/91	6/13/91	6/14/91
Date Analyzed:	6/17/91	6/17/91	6/17/91
Sample Number:	10 700145.2	10 700154.1	10 700202.5
Run Number:	157	156	154
Sample Description:	SPT-33-03	SPT-37-03	SPT-38-03

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	34	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/13/91	6/17/91	6/17/91
Date Analyzed:	6/17/91	6/17/91	6/17/91
Sample Number:	10 700174.6	10 700260.2	10 700261.
Run Number:	155	178	180
Sample Description:	SPT-39-03	SPT-16-01	SPT-16-02

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	65	32	13
a-Chlordane	mg/kg	10	45	18	ND
4,4-DDD	mg/kg	10	150	110	56
4,4-DDT	mg/kg	10	43	19	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/17/91	6/17/91
Date Analyzed:	6/17/91	6/17/91
Sample Number:	10 700262.9	10 700263.7
Run Number:	175	182
Sample Description:	SPT-16-03	SPT-17-01

FIELD ANALYSIS

PESTICIDES	Units	MDL		
g-Chlordane	mg/kg	10	ND	58
a-Chlordane	mg/kg	10	ND	28
4,4-DDD	mg/kg	10	34	28
4,4-DDT	mg/kg	10	ND	10

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/17/91	6/17/91
Date Analyzed:	6/17/91	6/17/91
Sample Number:	10 700264.5	10 700265.3
Run Number:	184	186
Sample Description:	SPT-17-02	SPT-17-03

FIELD ANALYSIS

PESTICIDES	Units	MDL		
g-Chlordane	mg/kg	10	200	97
a-Chlordane	mg/kg	10	95	45
4,4-DDD	mg/kg	10	290	150
4,4-DDT	mg/kg	10	120	76

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/17/91	6/17/91	6/17/91
Date Analyzed:	6/18/91	6/18/91	6/18/91
Sample Number:	10 700266.1	10 700267.	10 700269.6
Run Number:	213	214	215
Sample Description:	SPT-25-01	SPT-25-02	DUP-25-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/17/91	6/17/91
Date Analyzed:	6/17/91	6/17/91
Sample Number:	10 700245.9	10 700246.7
Run Number:	172	173
Sample Description:	SPT-29-01	SPT-29-02

FIELD ANALYSIS

PESTICIDES	Units	MDL		
g-Chlordane	mg/kg	10	13	10
a-Chlordane	mg/kg	10	ND	ND
4,4-DDD	mg/kg	10	100	89
4,4-DDT	mg/kg	10	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/17/91	6/17/91
Date Analyzed:	6/17/91	6/17/91
Sample Number:	10 700247.5	10 700224.6
Run Number:	174	169
Sample Description:	SPT-29-03	SPT-58-01

FIELD ANALYSIS

PESTICIDES	Units	MDL		
g-Chlordane	mg/kg	10	ND	ND
a-Chlordane	mg/kg	10	ND	ND
4,4-DDD	mg/kg	10	17	ND
4,4-DDT	mg/kg	10	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/17/91	6/17/91
Date Analyzed:	6/17/91	6/17/91
Sample Number:	10 700225.4	10 700230.
Run Number:	170	171
Sample Description:	SPT-58-02	DUP-58-01

FIELD ANALYSIS

PESTICIDES	Units	MDL		
g-Chlordane	mg/kg	10	ND	ND
a-Chlordane	mg/kg	10	ND	ND
4,4-DDD	mg/kg	10	ND	ND
4,4-DDT	mg/kg	10	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/17/91	6/17/91	6/17/91
Date Analyzed:	6/18/91	6/18/91	6/18/91
Sample Number:	10 700227.	10 700228.9	10 700242.4
Run Number:	190	191	193
Sample Description:	SPT-57-01	SPT-57-02	SPT-62-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/17/91	6/17/91	6/17/91
Date Analyzed:	6/18/91	6/17/91	6/17/91
Sample Number:	10 700243.2	10 700185.1	10 700186.
Run Number:	194	166	165
Sample Description:	SPT-62-02	SPT-59-01	SPT-59-02

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	32
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/17/91	6/17/91
Date Analyzed:	6/17/91	6/18/91
Sample Number:	10 700187.8	10 700236.
Run Number:	167	199
Sample Description:	SPT-59-03	SPT-61-01

FIELD ANALYSIS

PESTICIDES	Units	MDL		
g-Chlordane	mg/kg	10	ND	ND
a-Chlordane	mg/kg	10	ND	ND
4,4-DDD	mg/kg	10	ND	ND
4,4-DDT	mg/kg	10	ND	ND

MDL = Method Detection Limit

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/17/91	6/17/91
Date Analyzed:	6/18/91	6/18/91
Sample Number:	10 700237.8	10 700259.4
Run Number:	200	201
Sample Description:	SPT-61-02	DUP-61-01

FIELD ANALYSIS

PESTICIDES	Units	MDL		
g-Chlordane	mg/kg	10	ND	ND
a-Chlordane	mg/kg	10	ND	ND
4,4-DDD	mg/kg	10	ND	ND
4,4-DDT	mg/kg	10	ND	ND

MDL = Method Detection Limit

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/17/91	6/17/91	6/17/91
Date Analyzed:	6/18/91	6/18/91	
Sample Number:	10 700233.5	10 700234.3	10 700235.1
Run Number:	196	197	
Sample Description:	SPT-60-01	SPT-60-02	SPT-60-03

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	13	11	ND

MDL = Method Detection Limit

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/17/91	6/17/91
Date Analyzed:	6/18/91	6/18/91
Sample Number:	10 700231.9	10 700232.7
Run Number:	203	204
Sample Description:	SPT-A-01	SPT-B-01

FIELD ANALYSIS

PESTICIDES	Units	MDL		
g-Chlordane	mg/kg	10	64	ND
a-Chlordane	mg/kg	10	30	ND
4,4-DDD	mg/kg	10	ND	ND
4,4-DDT	mg/kg	10	ND	ND

MDL = Method Detection Limit

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/17/91	6/17/91
Date Analyzed:	6/18/91	6/18/91
Sample Number:	10 700240.8	10 700241.6
Run Number:	205	212
Sample Description:	SPT-C-01	SPT-D-01

FIELD ANALYSIS

PESTICIDES	Units	MDL		
g-Chlordane	mg/kg	10	38	50
a-Chlordane	mg/kg	10	18	31
4,4-DDD	mg/kg	10	ND	12
4,4-DDT	mg/kg	10	ND	31

MDL = Method Detection Limit

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/18/91	6/18/91	6/18/91
Date Analyzed:	6/21/91	6/21/91	6/21/91
Sample Number:	10 700296.3	10 700297.1	10 700299.8
Run Number:	345	273	347
Sample Description:	SPT-03-01	SPT-03-02	SPT-04-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/18/91	6/18/91	6/18/91
Date Analyzed:	6/19/91	6/21/91	6/19/91
Sample Number:	10 700300.5	10 700293.9	10 700294.7
Run Number:	272	366	284
Sample Description:	SPT-04-02	SPT-02-01	SPT-02-02

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/18/91	6/18/91	6/18/91
Date Analyzed:	6/21/91	6/19/91	6/21/91
Sample Number:	10 700305.6	10 700303.	10 700305.6
Run Number:	341	281	352
Sample Description:	SPT-05-01	SPT-05-02	DUP-05-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	15	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	12	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/18/91	6/18/91	6/19/91
Date Analyzed:	6/21/91	6/19/91	6/21/91
Sample Number:	10 700306.4	10 700307.2	10 700320.
Run Number:	362	282	351
Sample Description:	SPT-06-01	SPT-06-02	SPT-06-2.5

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	28	18	16
a-Chlordane	mg/kg	10	15	ND	12
4,4-DDD	mg/kg	10	50	56	58
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/18/91	6/19/91	6/19/91
Date Analyzed:	6/22/91	6/20/91	6/19/91
Sample Number:	10 700308.	10 700309.9	10 700310.2
Run Number:	387	301	279
Sample Description:	SPT-06-03	SPT-07-01	SPT-07-02

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	11	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	30	32	20
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/19/91	6/19/91	6/18/91
Date Analyzed:	6/22/91	6/20/91	6/21/91
Sample Number:	10 700311.	10 700325.	10 700270.
Run Number:	385	292	355
Sample Description:	SPT-07-03	SPT-16-2.5	SPT-18-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	16	27
a-Chlordane	mg/kg	10	ND	ND	11
4,4-DDD	mg/kg	10	14	56	ND
4,4-DDT	mg/kg	10	ND	14	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/18/91	6/19/91	6/18/91
Date Analyzed:	6/19/91	6/20/91	6/22/91
Sample Number:	10 700271.8	10 700323.4	10 700272.6
Run Number:	275	295	380
Sample Description:	SPT-18-02	SPT-18-2.5	SPT-18-03

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	12	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	60	12	19
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/18/91	6/18/91	6/18/91
Date Analyzed:	6/21/91	6/20/91	6/20/91
Sample Number:	10 700274.2	10 700275.	10 700326.9
Run Number:	360	290	297
Sample Description:	SPT-19-01	SPT-19-02	SPT-19A-2.5

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/18/91	6/18/91	6/18/91
Date Analyzed:	6/21/91	6/19/91	6/22/91
Sample Number:	10 700277.7	10 700278.5	10 700279.3
Run Number:	342	276	390
Sample Description:	SPT-20-01	SPT-20-02	SPT-20-03

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/18/91	6/18/91	6/18/91
Date Analyzed:	6/21/91	6/19/91	6/22/91
Sample Number:	10 700280.7	10 700281.5	10 700282.3
Run Number:	343	278	382
Sample Description:	SPT-21-01	SPT-21-02	SPT-21-03

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/18/91	6/18/91	6/17/91
Date Analyzed:	6/21/91	6/21/91	6/22/91
Sample Number:	10 700248.3	10 700249.1	10 700250.5
Run Number:	371	369	406
Sample Description:	SPT-24-01	SPT-24-02	SPT-24-03

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	18	ND
a-Chlordane	mg/kg	10	ND	10	ND
4,4-DDD	mg/kg	10	ND	23	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/17/91	6/17/91	6/17/91
Date Analyzed:	6/18/91	6/18/91	6/18/91
Sample Number:	10 700266.1	10 700267.	10 700269.6
Run Number:	213	214	215
Sample Description:	SPT-25-01	SPT-25-02	DUP-25-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/18/91	6/18/91	6/18/91
Date Analyzed:	6/22/91	6/19/91	6/21/91
Sample Number:	10 700283.1	10 700284.	10 700286.6
Run Number:	400	285	344
Sample Description:	SPT-26-01	SPT-26-02	SPT-27-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	23
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	45
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/18/91	6/19/91	6/18/91
Date Analyzed:	6/20/91	6/21/91	6/22/91
Sample Number:	10 700287.4	10 700318.8	10 700288.2
Run Number:	287	340	384
Sample Description:	SPT-27-02	SPT-27-2.5	SPT-27-03

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	14	ND	13
a-Chlordane	mg/kg	10	ND	13	ND
4,4-DDD	mg/kg	10	53	15	25
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/18/91	6/18/91	6/18/91
Date Analyzed:	6/21/91	6/20/91	6/21/91
Sample Number:	10 700289.	10 700290.4	10 700317.
Run Number:	348	288	339
Sample Description:	SPT-28-01	SPT-28-02	SPT-28-2.5

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	33	170	140
a-Chlordane	mg/kg	10	21	74	65
4,4-DDD	mg/kg	10	ND	220	220
4,4-DDT	mg/kg	10	ND	93	130

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/18/91	6/18/91	6/18/91
Date Analyzed:	6/22/91	6/21/91	6/20/91
Sample Number:	10 700292.	10 700291.2	10 700322.6
Run Number:	389	359	296
Sample Description:	SPT-28-03	DUP-28-01	SPT-29-2.5

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	170	31	ND
a-Chlordane	mg/kg	10	79	21	ND
4,4-DDD	mg/kg	10	260	ND	59
4,4-DDT	mg/kg	10	180	ND	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/19/91	6/19/91	6/18/91
Date Analyzed:	6/20/91	6/20/91	6/21/91
Sample Number:	10 700324.2	10 700321.8	10 700319.6
Run Number:	293	298	356
Sample Description:	SPT-30-2.5	SPT-37-2.5	SPT-38-2.5

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	14	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	32	ND	28
4,4-DDT	mg/kg	10	ND	14	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/19/91	6/17/91	6/17/91
Date Analyzed:	6/21/91	6/22/91	6/22/91
Sample Number:	10 700315.3	10 700251.3	10 700252.1
Run Number:	358	405	401
Sample Description:	SPT-39-2.5	SPT-41-01	SPT-41-02

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	53	ND	19
a-Chlordane	mg/kg	10	40	ND	ND
4,4-DDD	mg/kg	10	160	ND	14
4,4-DDT	mg/kg	10	31	ND	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/17/91	6/17/91	6/17/91
Date Analyzed:	6/22/91	6/22/91	6/22/91
Sample Number:	10 700254.8	10 700255.6	10 700257.2
Run Number:	404	402	403
Sample Description:	SPT-42-01	SPT-42-02	SPT-43-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	ND	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/17/91	6/19/91	6/19/91
Date Analyzed:	6/22/91	6/22/91	6/20/91
Sample Number:	10 700258.	10 700316.1	10 700312.9
Run Number:	399	396	302
Sample Description:	SPT-43-02	SPT-59-2.5	SPT-E-01

FIELD ANALYSIS

PESTICIDES	Units	MDL			
g-Chlordane	mg/kg	10	ND	ND	ND
a-Chlordane	mg/kg	10	ND	ND	ND
4,4-DDD	mg/kg	10	ND	46	ND
4,4-DDT	mg/kg	10	ND	ND	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

PACE, Inc. **DRAFT REPORT** 6/22/91

Brown and Caldwell
5110 Eisenhower Blvd.
Suite 230
Tampa, FL 33634

Attn : Ms. Susan Klinzing

RE: On-Site Analysis at the Chevron - Orlando Site
PACE Project Number: 910610.601

Date Collected:	6/19/91	6/18/91
Date Analyzed:	6/20/91	6/22/91
Sample Number:	10 700313.7	10 700314.5
Run Number:	311	378
Sample Description:	SPT-G-01	SPT-H-01

FIELD ANALYSIS

PESTICIDES	Units	MDL		
g-Chlordane	mg/kg	10	ND	ND
a-Chlordane	mg/kg	10	ND	ND
4,4-DDD	mg/kg	10	32	ND
4,4-DDT	mg/kg	10	ND	ND

MDL = Method Detection Limit
ND = Not detected at or above the MDL.

APPENDIX D

GENERATOR ID FORM

2 4 0201

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved. OMB No. 2050-0028 Expires 10-31-9
GSA No. 0246-EPA-O

Please refer to the *Instructions for Filing Notification* before completing this form. The information requested here is required by law (*Section 3010 of the Resource Conservation and Recovery Act*).

EPA Notification of Regulated Waste Activity

United States Environmental Protection Agency

Date Received (For Official Use Only)

I. Installation's EPA ID Number *(Mark 'X' in the appropriate box)*

[X] A. First Notification [ ] B. Subsequent Notification *(complete item C)*

C. Installation's EPA ID Number

II. Name of Installation *(Include company and specific site name)*

CHEVRON CHEMICAL COMPANY SITE

III. Location of Installation *(Physical address not P.O. Box or Route Number)*

Street: 3100 ORANGE BLOSSOM TRAIL

Street (continued):

City or Town: ORLANDO | State: FL | ZIP Code: 32805-

County Code: | County Name: ORANGE

IV. Installation Mailing Address *(See Instructions)*

Street or P.O. Box: SAME

City or Town: | State: | ZIP Code: -

V. Installation Contact *(Person to be contacted regarding waste activities at site)*

Name *(last)*: STAROSCIAK | *(first)*: NANCY

Job Title: FAC PLANNING ENG | Phone Number *(area code and number)*: 415-842-2437

VI. Installation Contact Address *(See Instructions)*

A. Contact Address Location [ ] Mailing [ ]

B. Street or P.O. Box: 6001 BOLLINGER CANYON RD.

City or Town: SAN RAMON | State: CA | ZIP Code: 94583-

VII. Ownership *(See Instructions)*

A. Name of Installation's Legal Owner: ROBERT R. UTTAL

Street, P.O. Box, or Route Number: P.O. BOX 621148

City or Town: ORLANDO | State: FL | ZIP Code: 32862-

Phone Number *(area code and number)*: 407-240-3440

B. Land Type: P | C. Owner Type: P | D. Change of Owner Indicator: Yes [ ] No [ ] | (Date Changed) Month Day Year

2 4 0202

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved. OMB No. 2050-0028. Expires 10-31-91
GSA No. 0246-EPA-OT

I.D. For Official Use Only

VIII. Type of Regulated Waste Activity *(Mark 'X' in the appropriate boxes. Refer to instructions.)*

A. Hazardous Waste Activity

1. Generator (See Instructions)
   - [X] a. Greater than 1000kg/mo (2,200 lbs.)
   - [ ] b. 100 to 1000 kg/mo (220 - 2,200 lbs.)
   - [ ] c. Less than 100 kg/mo (220 lbs.)
2. Transporter (Indicate Mode in boxes 1-5 below)
   - [ ] a. For own waste only
   - [ ] b. For commercial purposes

   Mode of Transportation
   - [ ] 1. Air
   - [ ] 2. Rail
   - [ ] 3. Highway
   - [ ] 4. Water
   - [ ] 5. Other - specify
3. [X] Treater, Storer, Disposer (at installation) Note: A permit is required for this activity; see instructions.
4. Hazardous Waste Fuel
   - [ ] a. Generator Marketing to Burner
   - [ ] b. Other Marketers
   - [ ] c. Burner - indicate device(s) - Type of Combustion Device
     - [ ] 1. Utility Boiler
     - [ ] 2. Industrial Boiler
     - [ ] 3. Industrial Furnace
5. [ ] Underground Injection Control

B. Used Oil Fuel Activities

1. Off-Specification Used Oil Fuel
   - [ ] a. Generator Marketing to Burner
   - [ ] b. Other Markerer
   - [ ] c. Burner - indicate device(s) - Type of Combustion Device
     - [ ] 1. Utility Boiler
     - [ ] 2. Industrial Boiler
     - [ ] 3. Industrial Furnace
2. Specification Used Oil Fuel Marketer (or On-site Burner) Who First Claims the Oil Meets the Specification
   - [ ]

IX. Description of Regulated Wastes *(Use additional sheets if necessary)*

A. Characteristics of Nonlisted Hazardous Wastes. Mark 'X' in the boxes corresponding to the characteristics of nonlisted hazardous wastes your installation handles. *(See 40 CFR Parts 261.20 - 261.24)*

1. Ignitable (D001)	2. Corrosive (D002)	3. Reactive (D003)	4. Toxicity Characteristic (D000)	(List specific EPA hazardous waste number(s) for the Toxicity Characteristic contaminant(s))
[ ]	[ ]	[ ]	[X]	

B. Listed Hazardous Wastes. (See 40 CFR 261.31 - 33. See instructions if you need to list more than 12 waste codes.)

1	2	3	4	5	6
7	**8**	**9**	**10**	**11**	**12**

C. Other Wastes. (State or other wastes requiring an I.D. number. See instructions.)

1	2	3	4	5	6

X. Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment.

Signature	Name and Official Title *(type or print)*	Date Signed
	NANCY STAROSCIAK, P.E.	

XI. Comments

Note: Mail completed form to the appropriate EPA Regional or State Office. (See Section III of the booklet for addresses.)

APPENDIX E

MANIFEST FORMS

Please print or type (Form designed for use on elite (12-pitch) typewriter.) Form Approved OMB No. 2050-0039 Expires 9-30-91

UNIFORM HAZARDOUS WASTE MANIFEST

1 Generator's US EPA ID No. | Manifest Document No. | 2 Page 1 of | Information in the shaded areas is not required by Federal law.

GENERATOR

3. Generator's Name and Mailing Address

4. Generator's Phone ( )

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name | 6. US EPA ID Number

C. State Transporter's ID

D. Transporter's Phone

7. Transporter 2 Company Name | 8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address | 10. US EPA ID Number

G. State Facility's ID

H. Facility's Phone

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No	Type	13. Total Quantity	14. Unit Wt/Vo	I. Waste No.
a.					
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name | Signature | Month Day Year

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19

Printed/Typed Name | Signature | Month Day Year

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete

[Appendix, Form 8700-22]

Appendix—Uniform Hazardous Waste Manifest and Instructions (EPA Forms 8700-22 and 8700-22A and Their Instructions)

[Added by 49 FR 10500, March 20, 1984; amended by 51 FR 35192, October 1, 1986; 53 FR 45090, November 8, 1988]

[*Editor's note:* EPA and OMB Feb. 16, 1989, outlined the following three ways in which manifest users can comply with the burden disclosure statement requirement (54 FR 7036):

1. The statement is printed on the form. The burden statement would, therefore, accompany the waste during shipment. Generators, transporters, and TSD would have the opportunity to see the statement.

2. The statement is printed in the instructions to the form. This approach may result in the following two outcomes, either of which is acceptable to OMB:

Outcome A. The instructions may be on a separate sheet of paper which is removed or detached from the manifest after it is filled out by the generator. The statement would not accompany the shipment. Although all parties to the shipment may not have the opportunity to see the statement, complying in this way is acceptable to OMB.

Outcome B. The instructions may be printed on the form or on the back of the form. In this case, the burden statement would accompany the form during shipment and all parties to the shipment would have the opportunity to see it.

3. The statement is attached to the form. In this case the OMB burden statement is on a separate sheet of paper and must be conveyed with the form and the shipment from the generator to the treatment, storage or disposal facility (TSD). One copy of the statement could accompany each multicopy form provided it is attached in such a way as to remain with the manifest when it reaches the TSD.

One situation, that of the detachable instructions, results in the burden statement not accompanying the form during waste shipment. This is acceptable to OMB, according to the agency.
(See also editor's note at 161:1901.)]

U.S. EPA Form 8700-22

Read all instructions before completing this form.

This form has been designed for use on a 12-pitch (elite) typewriter; a firm point pen may also be used — press down hard.

Federal regulations require generators and transporters of hazardous waste and owners or operators of hazardous waste treatment, storage, and disposal facilities to use this firm (8700-22) and, if necessary, the continuation sheet (Form 8700-22A) for both inter and intrastate transportation.

Federal regulations also require generators and transporters of hazardous waste and owners or operators of hazardous waste treatment, storage and disposal facilities to complete the following information:

• • • • •

GENERATORS

Item 1. Generator's U.S. EPA ID Number — Manifest Document Number

Enter the generator's U.S. EPA twelve digit identification number and the unique five digit number assigned to this Manifest (e.g., 00001) by the generator.

Item 2. Page 1 of ____

Enter the total number of pages used to complete this Manifest, i.e., the first page (EPA Form 8700-22) plus the number of Continuation Sheets (EPA Form 8700-22A), if any.

Item 3. Generator's Name and Mailing Address

Enter the name and mailing address of the generator. The address should be the location that will manage the returned Manifest forms.

APPENDIX F

STORMWATER CALCULATIONS

CHEVRON ORLANDO SITE
Removal Action Plan
July 22, 1991

Stormwater Calculations
(during the Removal Action)

Assumptions:

No Offsite Discharge.
Infiltration Rate = 4 feet per day.
Site Divided into Two Basins: A & B.
Rainfall, inches:
100 Year - 72 hour = 13.6

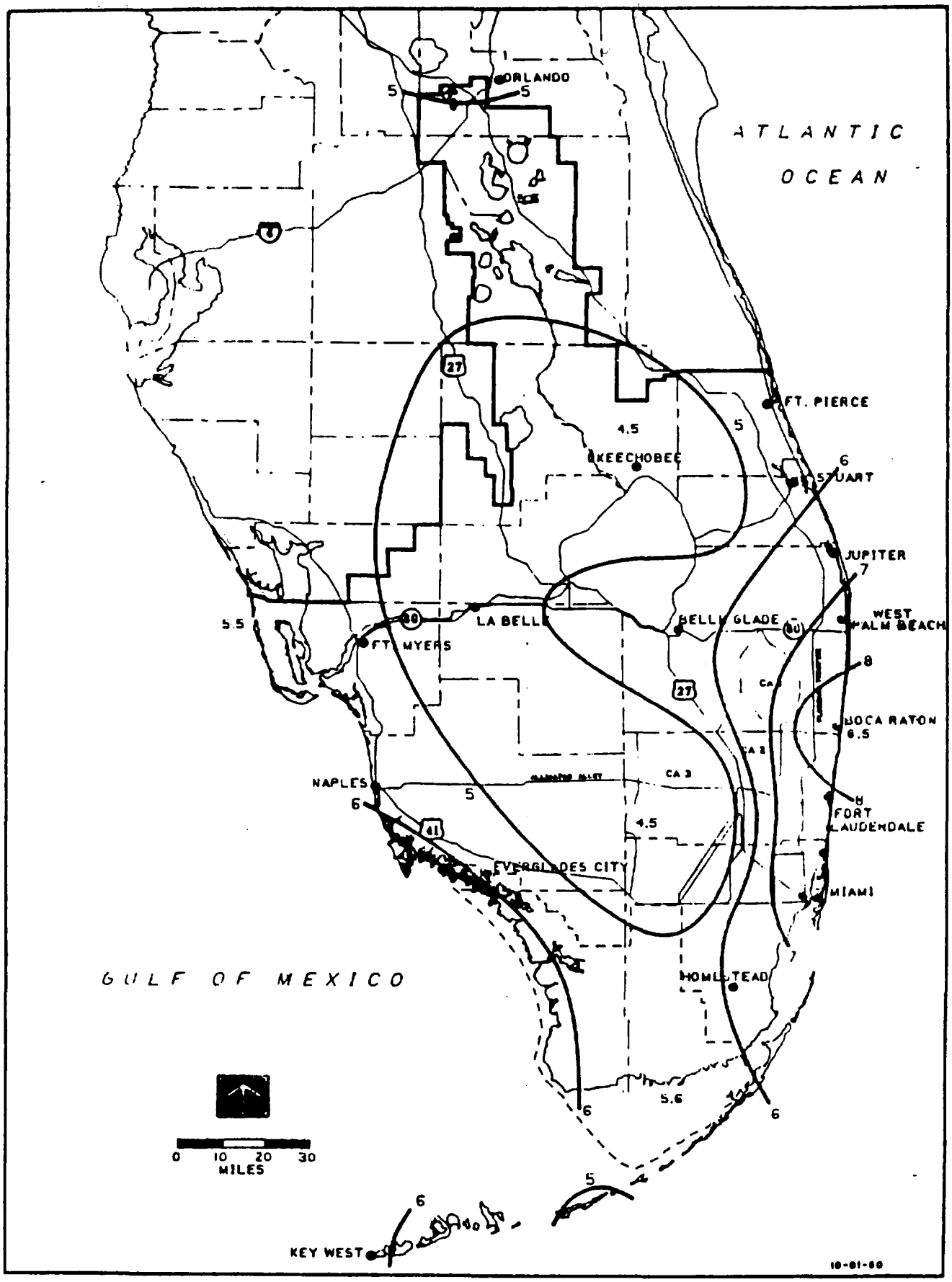
BASIN "A" RUNOFF CALCULATIONS:
(See Figure 4-12)

Area =	146,200	sq. ft.
	3.36	acres
Runoff Coeff. =	0.7	(after building demo)
Runoff Volume	2.66	acre-feet
	115,900	cu. feet

BASIN "A" VOLUME CALCULATIONS:

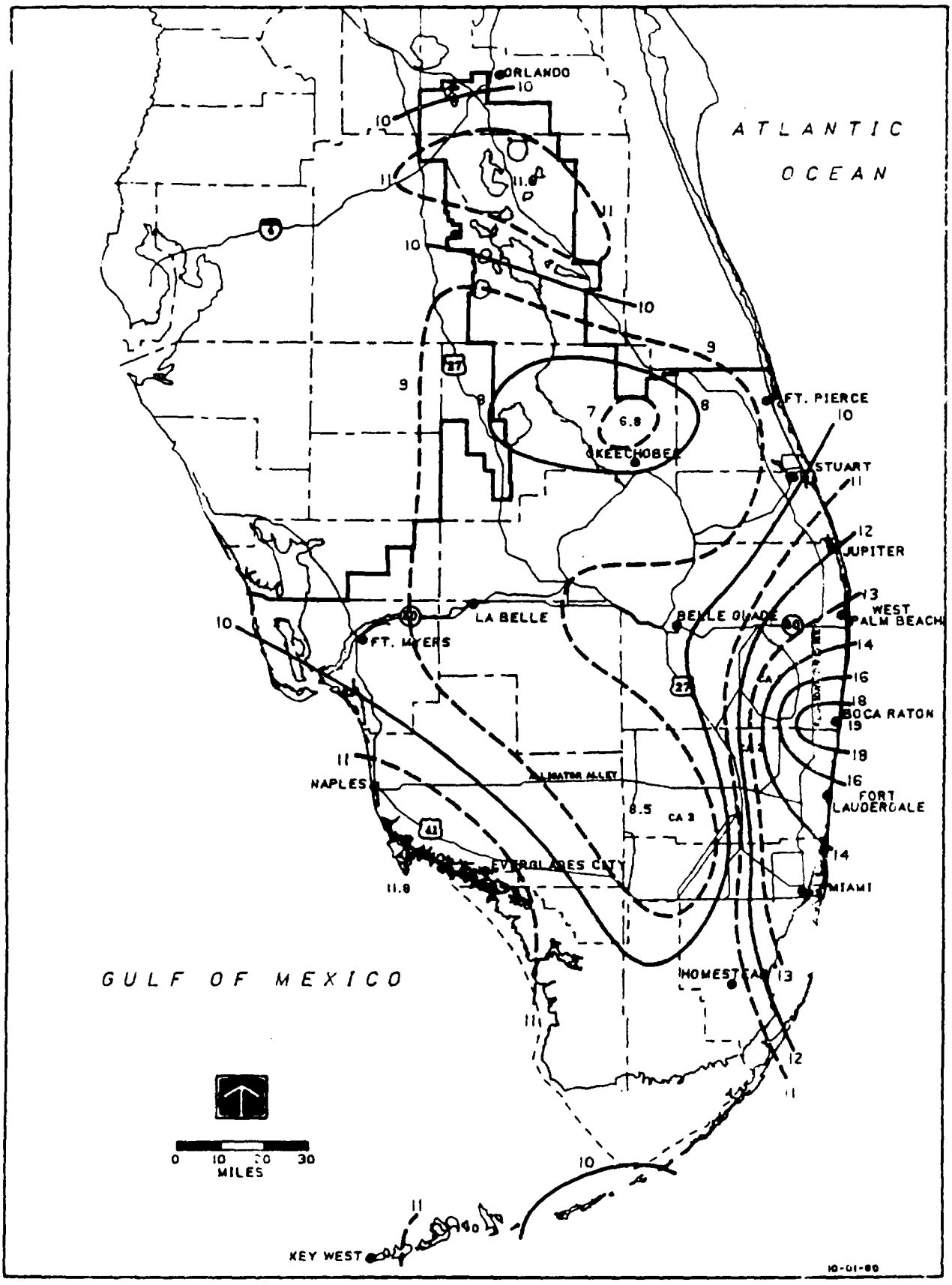
Elevation (MSL)	Area (sq.ft.)	Average Area (sq.ft.)	Incremental Volume (cu.ft.)	Total Volume (cu.ft.)	Total Volume (acre-ft)
99	9,000		0	0	0
		45,125			
100	81,250		45,125	45,125	1.04
		112,725			
101	144,200		112,725	157,850	3.62
		145,200			
102	146,200		145,200	303,050	6.96

100 Year - 24 Hour Storm Elevation = 100.6



1-DAY RAINFALL: 5 YEAR RETURN PERIOD

Figure C-I-3



1 - DAY RAINFALL : 100 YEAR RETURN PERIOD

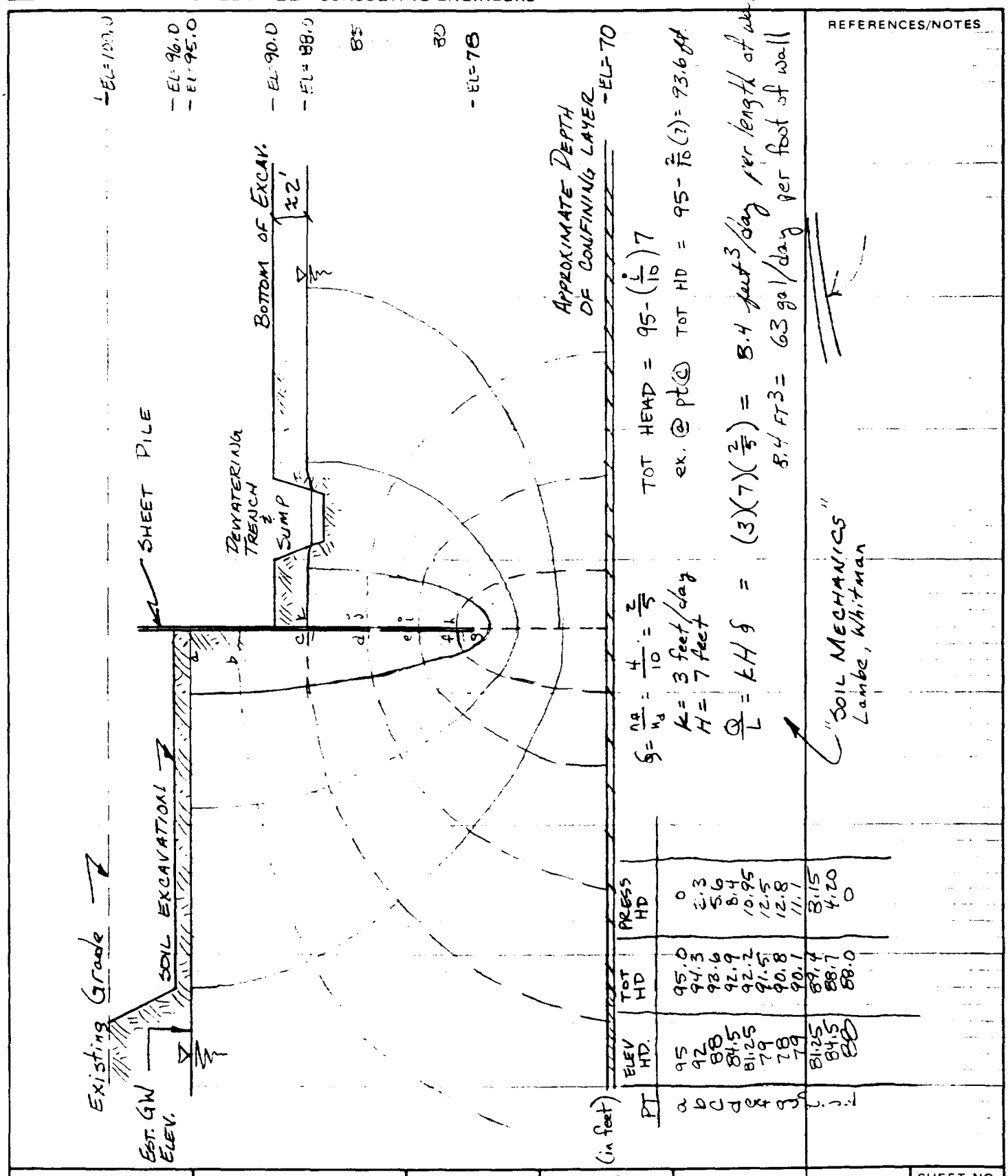
C-I-7

Figure C-I-6

APPENDIX G

FLOW NET ANALYSIS

BROWN AND CALDWELL CONSULTING ENGINEERS



PT	ELEV HD.	TOT HD	PRESS HD
a	95	95.0	0
b	92	94.3	2.3
c	88	93.6	5.6
d	84.5	92.9	8.4
e	81.25	92.2	10.95
f	79	91.5	12.5
g	78	90.8	12.8
h	79	90.1	11.1
i	81.25	89.4	8.15
j	84.5	88.7	4.20
k	88	88.0	0

DATE CHECKED	CHECKED BY	JOB NUMBER	BY	DATE	CALC. NO.	SHEET NO.
		6123	Mike Smith	7-20-91		1/2

CHEVRON ORLANDO SITE — PROJECT

DEWATERING CALCULATIONS — SUBJECT

GEN-021-3/5/85

BROWN AND CALDWELL CONSULTING ENGINEERS

REFERENCES/NOTES

50 ft x 60 ft well

= 330 linear feet of well

x 63 gal/day per linear feet

13,860 gal/day ≈ 10 gpm

USE FOR TREATMENT PLANT & EXFILTRATION TRENCH DESIGN FLOW.

DATE CHECKED	CHECKED BY	JOB NUMBER	BY	DATE	CALC. NO.	SHEET NO.
		6123	M. Hoogwerf	7-20-91		2/2

PROJECT

SUBJECT: DEWATERING CALCS.